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Laboratory Aids Steel Treater

Specific Instances of Value of Cooperation— Relation of Laboratory Operations to Steel Treating

BY ARTHUR W. F. GREEN*

THE laboratory and its relation to the steel treater is a much discussed topic. The reasons for this are many. A particularly outstanding one is that which entails the interpretation of laboratory findings into understandable terms for shop use. This is because the "man at the fire" sees his end of the problem in an entirely practical way, while the laboratorian is often interested in findings confined to relatively small sections, and, in his eagerness to convince from his standpoint, neglects the estimation or interpretation of those findings in the shop practices.

It is absolutely necessary, therefore, for the laboratory worker, regardless of whether he is called the chemist or metallurgist, who is employed in a plant doing heat treatment work, to have a firm, basic knowledge of fundamental facts concerning the metal and materials used in his plant. He must constantly acquire and put to use new things concerning his work, so that he may function in producing efficiency, and in increasing production as well as in decreasing cost. To do that he must learn to interpret findings into language which the "man at the fire" will comprehend.

There is the question of laboratory control in those plants whose management does not see the immediate need for a laboratory of its own, or who cannot assume the financial burden such equipment entails. Consequently, there are commercial laboratories in existence, manned by highly efficient and practically-trained men,

*Sales metallurgist Illingworth Steel Co., Philadelphia.

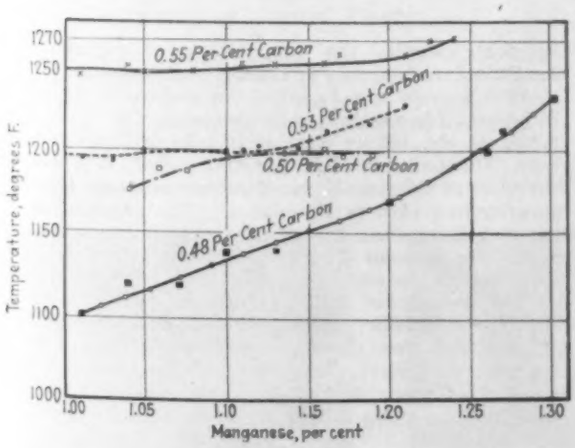


Fig. 1

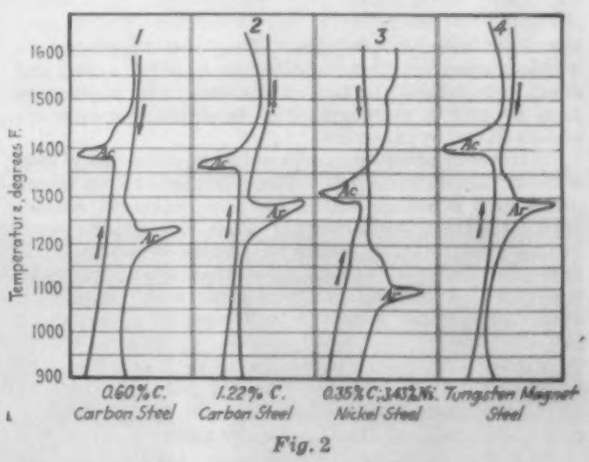


Fig. 2

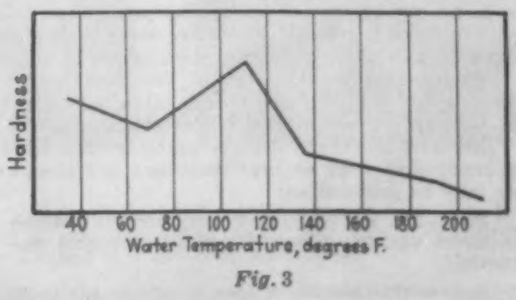


Fig. 3

Fig. 1—Correct Tempering Temperatures for a Steel of Specific Chemical Analysis

Fig. 2—Transformation Points of Several Types of Steel

Fig. 3—Effects of Temperature of Water for Quenching on the Hardness of Steel

whose physical and mental equipment is at the service of such organizations.

Why Laboratory Control Is Needed

The average man who buys steel for making his product has a definite knowledge of his manufacturing processes and adopts such apparatus as is most economical to do the work, and with which he is most familiar. It is, accordingly, a revelation to visit some of the plants where heat treating plays an important part and to see what is being done.

One plant with which the writer is familiar produces all kinds of chisels and kindred tools, having a monthly consumption of 25 tons of tool steel. Every tool produced is heated for hardening in a small brick box, open in the front, about 12 in. wide, 8 in. high, and 6 in. deep. A gas burner is placed on one side, and no attempt is made to baffle the flame. The tools are laid across the bottom and the flame impinges on them. They are rotated toward the burner, and quenched in water starting with the one nearest the flame, thus causing a steady flow through the so-called furnace. The tools produced give splendid satisfaction, except those made on very dark days, or when the operator becomes ill or stays away.

Another plant making a widely advertised and used article hardens the main blades of this product by heating them over a coke fire. They are supported on wedge-shaped cast iron pieces about 6 in. apart and about 6 in. above the bed of the fire. The blades are from 8 to 24 in. in length, 2 in. in width, and approximately ⅛-in. in thickness.

Numerous other instances could be cited, all giving more or less satisfaction. There is, however, a factor in all such workings which, for some unknown reason, receives little attention. This is the "human element." In no plant visited, where unusually crude methods have been used, were there more than one or two men who could perform certain treatments well. Naturally, such men are not expected to become ill or grow old rapidly.

Another feature, which is more or less difficult to surmount, is that the type of workmen doing treatment work with seemingly crude equipment has no time to hear about findings of a laboratory nature.

This should not be taken to mean that the practical man is not an artist, for he is often more than that; he is sometimes a genius. There are many little things that the practical heat treater does, which seemingly have no place in the workings of the laboratory, but thought as to why they are done is often the sign-post to a short cut for arriving at a conclusion.

There are, therefore, definite paths for the laboratory engaged in work on heat treatment to follow, and these may be grouped as:

First—The making of sufficient chemical analyses to insure uniformity both of new and produced materials.

Second—The making of such metallographic study as will insure definite knowledge of the results of all mechanical and heat-treating operations.

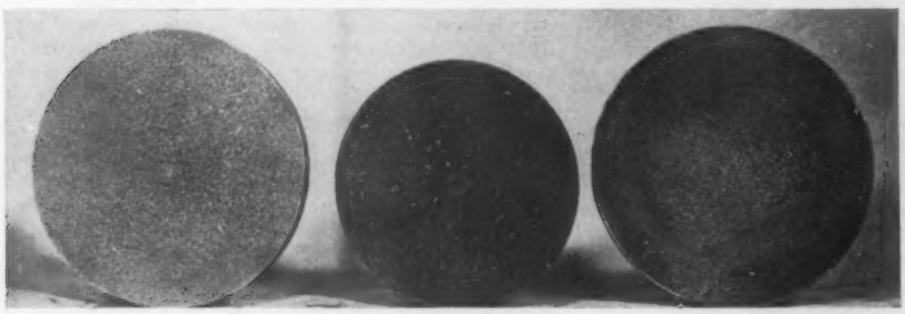
Third—The making of such physical tests as will give the most useful information in relation to the ultimate usage of the articles produced.

Fourth—The study and investigation of such manipulations and equipments as will be beneficial toward lowering production costs and striving for maximum efficiency.

Chemical Analyses Essential

The problem of making chemical analyses is not in itself difficult, especially since most producers of steel have more or less elaborate laboratory control of their product. It is essential, however, to check up, on shipments received those elements which are counted upon to impart necessary physical and structural conditions in the finished product. Thus, analyses for carbon and alloys should always be made.

One of the most important points in the making of chemical analyses of metals is the preparation of the samples to be used. Many who are not familiar with laboratory findings believe that all it is necessary to do is to drill a hole and save the drillings, or mill the required sample. No attention is paid to surface conditions of the sample, or whether or not oil may be present on the drill, etc. Sometimes the very efficient mechanic helps the milling cutter or the drill by using just a little oil or cutting fluid. His intentions are good, but he has added a distinct worry for the analyst.



(1) (2) (3)

Fig. 4—Structural Conditions Revealed by the Macro-etching of Three Lots of Steel

In other words, the preparation of samples for analytical work should be carefully attended to.

It is always wise to grind the surface of materials to be used for analysis until absolutely free from dirt, scale, oil, etc., before starting to take drillings or millings. On steels over 0.50 per cent carbon, it is wise to throw away the first ⅛ in. of sample to insure that the decarburized skin is eliminated. The preparation of samples from sheet material is especially needful of care. The samples should be carefully ground on both sides and on the edges.

The use of flat drills and special milling cutters, which are set aside for use only on sample preparation, is important, since there is less chance for their becoming oiled and dirty. It certainly should be borne in mind at all times that oil must not come into contact with metal samples, which are to be used for chemical analyses.

The heat treater must necessarily pay attention to the fuels he uses, and have such analyses made as will insure him the maximum heating values, etc., that he pays for. He should have analyses made of flue gases, since much money can easily be sent up the chimney.

The correct use of chemical analysis and interpretation of findings enables the heat treater to lay out his course of action, armed with definite knowledge of the materials he is handling. The results of his work are more definitely studied by careful metallographic and physical testings.

Metallographic Consideration

Some idea of the application laboratory findings may have for the steel treater is afforded by a study of the chart shown in Fig. 1. This was made after careful

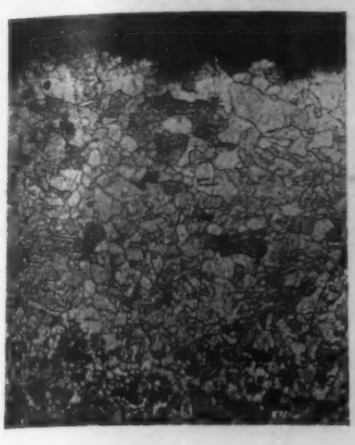


Fig. 5

Fig. 6

Fig. 7

Fig. 5—Longitudinal Section of Rolled Structure. X 100. Etched in 2 per cent nitric acid. Fig. 6—Longitudinal section of rolled structure. X 100. Etched in 2 per cent nitric acid. Fig. 7—Longitudinal section of heat-treated structure. X 100. Etched in 2 per cent nitric acid

consideration and study of a large number of specimens of steel which conformed to the following specifications:

	Per Cent		Per Cent
Carbon	0.45-0.55	Silicon	0.15-0.25
Manganese	1.00-1.30	Nickel	0.10 max.
Phosphorus	0.030 max.	Chromium	0.10 max.
Sulphur	0.030 max.		

The physical requirements for the material, after heat treatment, were:

Elastic Limit, lb. per sq. in.	75,000
Tensile Strength, lb. per sq. in.	120,000
Elongation, per cent in 2 in.	20.0
Reduction of Area, per cent	45.0

In order to meet these physical requirements it was necessary to quench the steel from above the Ac critical range into oil, and then temper it to a point just below the Ar critical range. It had been found in plant operation that the tempering temperatures varied considerably for certain analyses, and the preparation of the chart by the laboratory eliminated a great deal of uncertainty as to the correct tempering temperatures to use for a steel of a specific chemical analysis.

Value of Critical Points

Another laboratory finding which proves of great help to the steel treater is the position of the critical or transformation points of the steels he uses. These points change according to the chemical analysis of different steels and, while there are sometimes very little differences in temperature to be noted, they have distinct relationship to grain size, etc., and also have a definite bearing on the physical contour of the pieces being treated. Typical transformation points of several types of steels are shown in Fig. 2.

A brief study or interpretation of the curves shown in Fig. 2 may be of interest. For instance, it is to be noted that the critical point on heating of the 1.22 per cent carbon steel, shown in section 2 of the chart, is approximately 1380 deg. Fahr. Therefore, a pocket-knife blade made from that material will be found to harden correctly if quenched from an indicated temperature of about 1400 deg. Fahr., or about 20 deg. Fahr. higher than the critical point. However, if a section one inch in diameter made from that steel, would be hardened, it would be found necessary to use a temperature of 1420-1440 deg. Fahr. In other words, the larger section of the second piece must be taken into consideration. Allowances must be made in all heat-treating work for mass and time considerations.

It has been stated that failures of materials quenched from some of the types of electric furnaces, equipped with thermo-indicating devices, which indicate the critical change of steel being heated, occur chiefly because of neglect of the factors of mass and time. Quenching from these furnaces, while it may be done

Fig. 8

Fig. 9

Fig. 10

Fig. 8—Longitudinal Section of Heat-Treated Structure. X 500. Etched in 2 per cent nitric acid. Fig. 9—Longitudinal section of rolled structure. X 100. Etched in 2 per cent nitric acid. Fig. 10—Longitudinal section of heat-treated structure. X 100. Etched in 2 per cent nitric acid

after the critical change has been indicated, is sometimes too rapid to allow for complete saturation.

The effect of quenching mediums such as oil, brine, water, air, etc., is a study which is by no means complete. The average steel treater quenches his metal in such mediums as will give him the best results. There are sometimes better methods or better coolants than he uses, but as best stated he is "getting by."

Experience with Pocket-Knife Blades

In this connection, an interesting problem is brought to mind. Difficulties were encountered in the manufacture of pocket-knife blades and the writer was called upon to decide whether or not the steel being used was at fault. Chemical analysis of the material revealed no cause for complaint, while heat treatments and metallographic studies in the laboratory were likewise insufficient to find the cause for the trouble, which was a cracking of the blades at the juncture of the blade and tang portions, or what is known as the "kick" section.

Fig. 11—Longitudinal Section of Heat-Treated Structure. X 500. Etched in 2 per cent nitric acid

A visit to the plant showed that the blades were heated for quenching in lead baths. Five or six blades were held in fan shape in special tongs and then immersed in the lead so that only the tangs were exposed. They were quenched in water, and tempering was done by allowing the residual heat in tangs to draw into the blade. It was noted that the water being used for quenching was very cold, being pumped from a nearby stream on which ice had formed. The outcome of the investigation was that the water was heated to about 90 deg. Fahr. and after that the cracking stopped.

The reason given for using the cold water was "the colder the water, the better the quench." That is not entirely so as will be seen from Fig. 3.

Macro- and Microscopic Investigation

The heat treater may be given the chemical analysis of his material, which is within the limits of the specification, and such other data as the critical points, time factors, etc. He may treat the steel according to the methods advised and which have been found to produce the best results, but his product fails to meet required physical tests or work conditions. He, naturally, rummages through his process looking for trouble, and generally reaches the conclusion that the steel is at fault.

The chemist points to the analysis to clear his skirts so that it is then necessary to resort to macro- and microscopic examinations. The revelations of these very often lead to the reasons for the failures.

The macro-etching of steel to determine such things as solid non-metallic inclusions, segregations, ingotism, porosity, surface defects, etc., is a process easily carried out and when the results of the treatment are correctly interpreted, serve as a good check. A distinct picture of some of the structural conditions revealed by the macro-etched treatment is seen in Fig. 4.

These samples represent three different lots of an alloy steel used in making automobile axles, and it is interesting to point out that the sample marked No. 1 is very clean and shows but slight porosity. The axles made from this lot were quite good and had very high impact value. The specimen marked No. 2 was quite dendritic and more porous than No. 1. The axles made from this lot of material passed the required physical test, but had a much lower impact value than the previous lot. Lot No. 3, as shown in specimen No. 3, Fig. 4, did not meet required impact test values after treatment. The etched structure shows distinct ingotism and porosity.

It is, therefore, quite evident that macro examination by suitable treatment serves as a check on structural conditions and may save much time and costly experimenting in the shop.

Microscopic studies serve as precise checks on the uniformity of structures that are produced by heat treatment, etc., and very often serve to give an idea of the previous history of the steel. This can be more readily understood by studying the photomicrographs Figs. 5, 6, 7 and 8, all of which were made from the same material. Figs. 5 and 6 show the structures of the steel as received from the mill. The structure shown in Fig. 5 reveals a heavily decarburized skin on the surface, while Fig. 6 shows the banded structure present near the center of the piece. These conditions point precisely to poor mill conditions in the rolling of the steel.

Figs. 7 and 8 represent the structures of the same steel after heat treatment, which consisted of quenching in oil from a temperature above the critical and drawing to a temperature just under the Ar point. The physical tests made were of interest in that the tensile test passed specifications but the impact value was very low.

In order that some idea of what the steel is when properly handled can be got by examining photomicrographs, Figs. 9, 10 and 11. The steel is of the same specification as that discussed previously. The rolled structure shown in Fig. 9 is quite homogeneous and entirely free from banding. It readily responded to heat treatments yielding structures such as shown in Figs. 10 and 11. This steel also had a very high impact value after treatment.

Special Investigations Recommended

Another phase of laboratory functioning, one which is invaluable in cooperating with the practical heat treater, is that entailing investigations of new operations, equipments, and materials. This means:

First—That there must be constant reading and study of old and new literature concerning the subjects generally met.

Second—The attendance at such lectures and meetings of a technical nature where problems such as are encountered in the plant are openly discussed.

Third—The working out of new ideas and suggestions in the laboratory, and the interpretation of the findings so that the shop man may benefit therefrom.

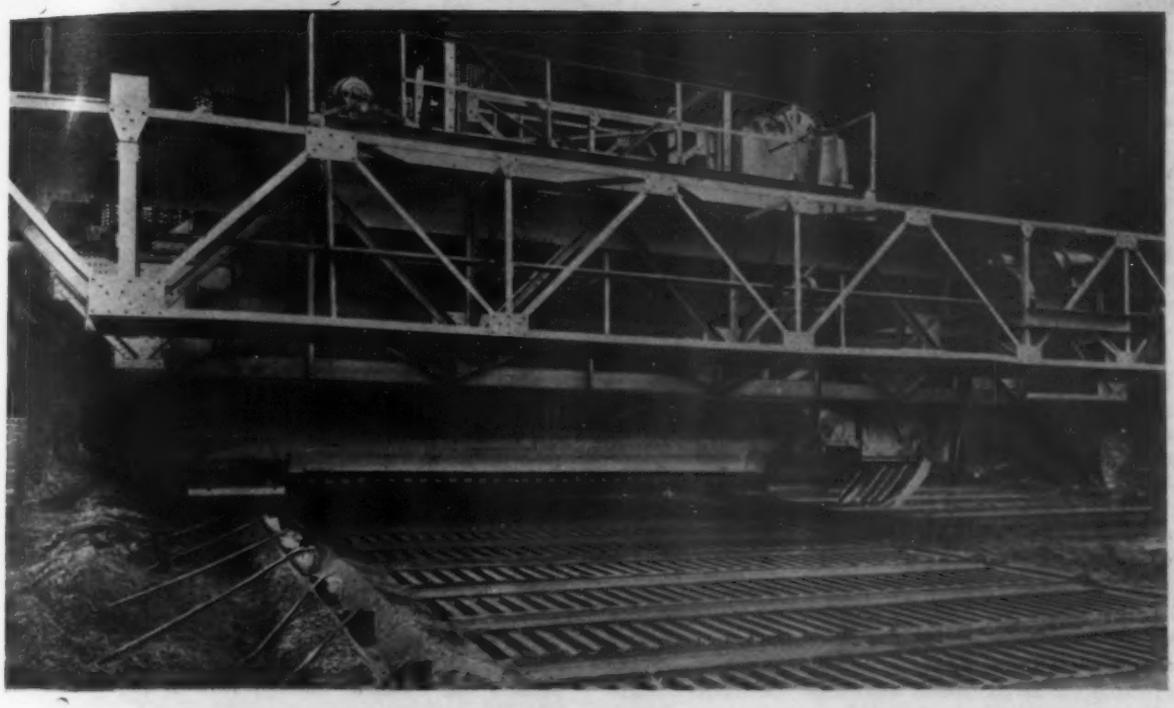
This does not mean that the laboratorian should be the only reader and investigator, but it does usually follow that he must be the leader in such work. The success with which he carries out his investigational work is entirely dependent upon how he interprets his results into shop usage.

Conclusions Reached

There have been set forth in this article specific instances where laboratory cooperation with a steel treater is helpful. It has been shown, without recourse to technical discussion, how it is possible to give to the practical man knowledge and information which is of benefit to him.

The laboratory can function as a part of routine when the cloak of mystification is removed and the personnel revealed as willing to discuss their findings in understandable terms.

The steel treater without the laboratory can and does do many important things, but invariably a little cooperation between him and an understanding laboratory will benefit all concerned, since not only is the element of chance lessened, but easier and more rapid methods very often result.



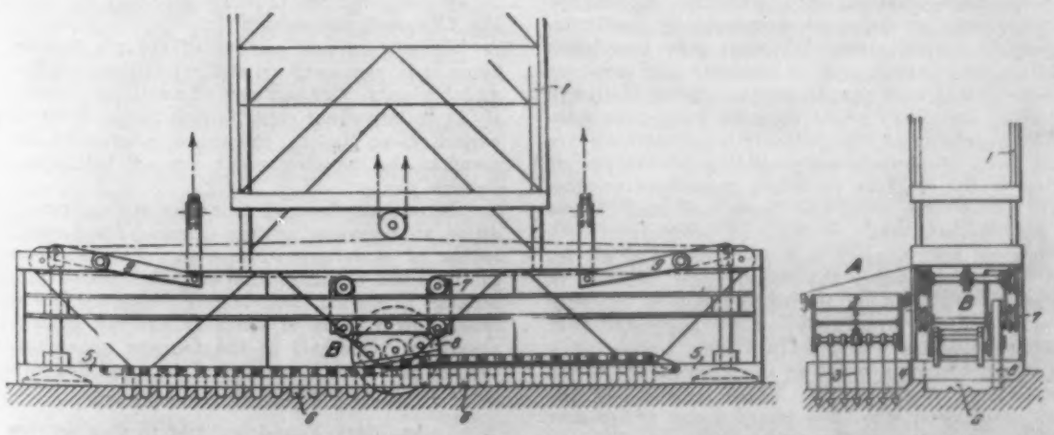
Machine Forms Pig Molds in Sand

Sand Cutting and Making of Molds and Runners in Cast House Floor Done Mechanically

A PIG-MOLDING machine, which cuts and prepares the sand of the cast house floor and then mechanically forms rows of pig molds, has been developed by the Demag Aktiengesellschaft, Duisburg, Germany, of which H. L. Schreck, Pittsburgh, is American representative. In this country there are two familiar ways of casting pig iron—the old method of running the molten metal from the tap hole of the blast furnace into hand-made runners and molds and the rapidly growing practice of pouring molten iron from ladles into the metal molds of a pig-casting machine. The Demag machine, however, mechanically forms runners and molds in the sand so that the iron is cast directly from the tap hole, as in the case of hand molding. The pigs cast in the mechanically formed molds are said to be uniform in size and shape, with smooth surfaces to which the sand does not adhere. Moreover, the pigs are notched to facilitate breaking.

The machine is operated by two men, an operator and a helper. The capacity of the machine is 27 fields of 28 pig molds each in about 30 min. or enough to take 45 gross tons of pig iron. One of these machines has been in continuous service in Germany since June, 1924.

The machine consists essentially of a preparing unit (*A*) and the molding machine proper (*B*). The two parts, interconnected by a vertical guide, are suspended from a trolley which travels on a crane girder. The machine may be raised or lowered from the trolley. In addition, the trolley can be adjusted to give the sand-preparing device and the molding ma-



The Pig Molding Machine Has a Capacity of 27 fields of 28 Pig Molds Each in 30 Min., or Enough to Take 45 Gross Tons of Pig Iron. In the drawing the longitudinal cross-section of the machine is shown at the left and the lateral cross-section at the right. "A" designates the sand-preparing unit and "B" the molding machine proper. Various numbered parts are identified in the text of the article

chine any degree of incline. Hence the pig molds may be given the desired longitudinal gradient.

The preparing attachment consists of a carriage (2) on which are mounted plow-shaped knives (3) and an adjustable stripping plate (4). The molding unit (*B*) is made up of a molding plate (5) with loose-hung pig patterns (6), and a pressure carriage (7) with a master wheel (8) and a lifting mechanism (9).

Operations are as follows: The entire machine is lowered to the cast house floor until the molding plate rests firmly on the sand. The carriage of the preparing attachment is then moved forward, drawing with it the plow-shaped knives, which dig about 20 in. into the floor and loosen a strip of sand a pig length in width. At the beginning of the return movement of the carriage the knives are automatically raised and the stripping plate is lowered to the floor, leveling the sand that has just been cut and shoving surplus sand into the next field to be prepared.

The entire molding machine is then hoisted, and the supporting crane is shifted the length of a pig so that when the machine is again lowered the molding plate lies on the strip of sand that has just been cut and leveled. The pig patterns hang loose in transverse slits in the molding plate. One after another they are pressed through the slits into the sand by the pressure carriage, which traverses the entire length of the plate. At the same time the master wheel, which is mounted on the carriage, forms the main runner for conducting the hot metal to the pig molds. The pressure of the molding plate prevents any shifting of the sand during molding, thereby insuring a clean-cut impression by the patterns. The preparation of the sand and the forming of the molds can be carried on simultaneously.

The preparing and molding units of the machine are attached to a common structural steel frame (1), which is suspended from the trolley structure and is raised and lowered by a double-rope lift. Two levers, by means of which the molding machine is connected with the cables, serve to reduce the speed of hoisting, permitting the patterns to rise slowly and smoothly from the sand. The levers in their operation press feet firmly against the floor. The downward pressure of the feet forces the entire frame of the machine upward, at the same time serving to steady the patterns and the molding plate—through which the feet pass—until they are suspended above the floor. Hence a clean draw of the patterns is assured, and damage to the molds is prevented. When the molding plate has been raised high enough so that the pig patterns clear the floor, the indirect lifting motion ceases and the complete structural frame, with the entire molding machine, is hoisted at full speed. The crane is then shifted the width of another field of pig molds, and operations are begun anew.

Remedies for Problems of the Foundry

Speaker at Newark Association Suggests Obtaining New Products for Manufacture—Mergers and Cooperative Effort Also Ways to Improve Conditions

PROBLEMS of the foundry industry, particularly those affecting jobbing foundries, were discussed at a meeting of the Newark Foundrymen's Association, Newark, N. J., Feb. 10, by Harry D. Neach, director market analysis division, Sherman Corporation, consulting industrial engineers, Boston. Mr. Neach based his conclusions on a survey which his company has made in the foundry industry, this survey having included personal visits to 67 plants in various States east of the Mississippi River.

His conclusions as to the causes for the present adverse conditions in the foundry industry were that there is too much plant capacity; potential business for the jobbing foundry has been destroyed by the building by many manufacturers of their own foundries; insufficient attention is paid to adequate cost accounting; there is a lack of proper merchandising ability in the foundry industry; profit margins have been narrowed by unintelligent competition; wage methods are in many cases obsolete in not providing for the proper incentive to the workers to obtain maximum production at lowest unit cost, and there are still in use many obsolete and costly methods of production.

Following Mr. Neach's address there was an informal discussion among the foundrymen present, in which stress was laid on the importance of knowing costs of production accurately. Some suggested that if jobbing foundries would refrain from taking work which does not show a profit an immense benefit to the entire industry would result. Those members of the Newark association who have joined a cost group now functioning as a part of the association's activities reported great savings. One department of a foundry which had shown a loss of $6000 in one year was put on a basis of paying for itself when a cost system was installed; in another case a large saving was effected in the cost of cleaning castings when labor wastes were discovered.

"Amateur Salesmanship" a Weakness

It was generally admitted that "amateur salesmanship" is one of the weaknesses of the jobbing foundry business. But on the other hand, it was pointed out that purchasing agents frequently are not to blame for "beating the price down" because they receive such a wide variety of prices on a specific job. Cases were cited of bids ranging from 4c. to 17c. a lb. on a certain item.

In analyzing the foundry situation Mr. Neach made the following statements:

"In getting any picture of today's foundry conditions it is necessary to study auxiliary plants as well as job plants. The increase of auxiliary foundry capacity is an important contributing factor in present overcapacitation; that is, the space, machinery and equipment in the industry which are not being put to productive use.

"Ninety per cent of foundries suffer from this condition to a greater or less degree. Over-capacity is a result of war-time expansion. As the demand for castings fell off after the war, this war-time capacity became a burden, and it has continued as such, because new volume of business has not been added to absorb it. One-half of the foundry space throughout the country today could well be used for other purposes than the making of castings.

Auxiliary Foundries Add to Competition

"The second major condition in the industry contributing to depression — what I have listed as the destruction of potential business—is due in large part to the development during the past few years of the

auxiliary foundries. You can recall many instances of concerns from which you secured profitable business in years past. They were without foundry equipment, and turned to you for their castings. Within the last two or three years many of these manufacturers have developed their own foundries. This has narrowed the market for castings and has introduced a new competitive factor, because these auxiliary plants have taken on foundry business other than their own to keep the foundry busy. One reason given by the auxiliary plant for establishing a foundry is that the foundrymen were charging them too high prices. Personally, I feel that this is not so, and I am confident that this feeling is borne out by the facts.

"Regular job foundries under the stress of competition intensified by the auxiliary plants have been taking considerable business at a very small profit, and in many cases below cost, which leads to the third problem, namely the insufficient attention to adequate costing. Foundries should adhere to the principle of accurate cost plus a fair profit. What is needed, rather than a cut-and-dried method or schedule of costs, is the ability to analyze constantly the costs and expenses of doing business, so that in selling castings a price is secured for them sufficient to cover a fair profit. Proper establishment of costs can be aided by close cooperation of foundrymen through their organizations.

Merchandising Knowledge Is Lacking

"Closely tied in with the cost problem is the lack of merchandising. Foundrymen have not made merchandising a matter of scientific study, such as has become the practice in other lines of industry. It now is necessary to the life of the industry to search thoroughly into potential markets, and to utilize all of the available knowledge of selling and advertising which readily can be summoned to the aid of the industry. The necessity of adequate merchandising will be increased, rather than diminished, because of the growing use of pressed steel and steel forgings in place of castings.

"The narrowing of profit margins is an effect due to causes, some of which I am suggesting, and another reason for thinning profit margins is the self-satisfaction of a great many foundrymen with their present methods, and their failure to keep these methods in step with changing conditions. Foundry costs comparatively are higher than they should be. Production lines are unsatisfactory and schedules uneven due to the fact that labor has not been producing to the extent that it might.

Wage Incentive Plans Bring Results

"A recent survey of wage methods by the Sherman Corporation showed that there is a real opportunity for foundrymen today through the installation of adequate wage incentive plans.

"This wage survey showed that 55 out of every 100 employees in the foundries surveyed were still being paid on the straight time basis, while 41 out of every 100 were on piece rate, and only 4 out of 100 on some form of premium or bonus. Payment of wages by straight time or day rate is unduly costly. Engineering authorities agree that only from 40 to 70 per cent of the value of wages paid on straight time comes back to the employer in the form of output.

"Foundrymen should give thorough attention to this matter of wage payment methods. A new method of paying wages will not work automatically, but must be installed soundly and thoroughly, so that it becomes rooted in employee goodwill, and becomes an active instrument in the hands of management for the reduction of costs, and the paying of employees a wage commensurate with their output. No time should be lost in analyzing thoroughly the wage payment situation in the industry, and developing a constructive program of wage incentive, based on production conditions and requirements.

"Antiquated methods of production still prevail in the foundry industry. Other industries have recognized that installation of modern machinery and methods that will reduce costs must be given consideration.

"Adequate production control, proper scheduling and routing prevail in a relatively small proportion of your plants.

"The production objective for a foundry, as for any other business, is to produce the maximum of goods of requisite quality in the shortest possible time, and at the lowest possible cost.

"There are few lines of industry indeed, which are not meeting today sharper competitive conditions than they have known in years. To meet such competition, manufacturers in other lines have sought every possible means and source of help in cutting down preventable waste, whether of time or of material, and to get over the necessity of such reductions of cost to the very last person in the organization.

Waste Reduction Important

"Employees should be shown the imperative necessity and also the desirability to them of cooperation in waste reduction. For example, carelessness in pouring a flask on the part of an employee means added cost. Unduly high percentages of castings on which corrective labor is necessary; unnecessary idle time; improper scheduling of work—all these and many other factors should be faced by foundry management, and every possible source of help sought in treating their causes constructively.

"In outlining conditions above, I have also touched here and there upon suggested remedies.

"Enlightened, aggressive management in your industry, on its toes and alert to correct every negative condition as soon as it is discovered can do for your industry what it has done for others. Foundry conditions are so grave that there should be no hesitation in taking every opportunity for help, counsel and suggestions. If someone from the outside gives the industry a good idea of practices that can help it, there is certainly nothing to be lost by taking advantage of such proposals.

New Products as a Source of Profit

"Another suggested remedy is the consideration by foundrymen of securing new products for manufacture and sale. This has possibilities in that a new product for which there is a market will give a steady business which can be controlled.

"The merging of unprofitable plants is, of course, one way out of some of the difficulties, and undoubtedly mergers will be effected to a considerable degree as one means of relief.

"However, other industries have faced problems as discouraging as those which now confront the foundry industry. There is no reason why alert, enlightened management cannot meet the situation squarely and work out its salvation with such help as is available today.

"The attitude of mind and the spirit in which the industry's problems are approached are vitally important, and for the foundry industry the old adage holds true, that 'If you think you are beaten, you are.'

"When management in your industry is infused with that spirit of determination which is latent in the industry, and resolves to utilize every sound and scientific means of available help, the foundry industry's problem can be solved."

Four 5-ton 75-ft. span electric cranes and five lumber unit hoists operating on 12,500 ft. of monorail will be supplied to the Clearwater Timber Co., Lewiston, Idaho, by the Harnischfeger Sales Corporation, Milwaukee. Each crane and hoist is equipped with an electrically operated grapple to handle 2000 to 3000 board feet of lumber at each lift.

The General Railway Signal Co., Rochester, N. Y., has been selected by the Japanese Government to install an automatic train control system on the railroads of that country, according to representatives of Japan's railroad system who are in this country on an inspection tour.

Integrated Steel Mill in Spain

Ore from Nearby Mountains Joins Imported Coal at Seaboard—Pig Iron, Billets and Finished Lines Made

BY DR. FRANK C. ROBERTS*

LOCATED at the port of Sagunto, Spain, on the shore of the Mediterranean Sea, 15 miles north of Valencia, is a new steel works plant. The site is of great historical interest. Three miles to the westward, on the inner edge of the Valencia coastal plain, which skirts this section of the Mediterranean shore, and crowning the outlying foothills of the Manera Mountains, lie the ruins of the ancient, fortified city of Saguntum, captured by Hannibal in 219 B. C. Few if any regions have been the scene of conflicts between as many conquering and succeeding races as this section of the Valencia plain. Its story is one of settlement, war and conquest, with all the varying degrees of happiness and horror that these words imply. The plain, varying in width from two to four miles, is the garden of the Province of Valencia, luxuriant with orange and olive trees grown under irrigation, by reason of the low annual rainfall.

Amid this setting, the Compañia Sidcrúrgica del Mediterráneo has built an iron and steel works of American design, for the purpose of utilizing the Sierra Manera iron ores. The product of the works consists of pig iron, billets, rails, beams, channels, angles, plates, merchant bars and rods. An article describing what was then the project appeared on page 48 of THE IRON AGE for Jan. 3, 1918.

*Frank C. Roberts & Co., Philadelphia

Iron Ore Supply

IRON ore deposits, owned by the Compañía Minera de Sierra Manera, an affiliated company, are located near Ojos Negros, and lie in the Manera Mountains, which divide the Provinces of Guadalajara and Teruel. Ojos Negros is the inland terminus of the railroad owned and operated by the company, and extending from the mines to the Port of Sagunto, a distance of about 131 miles, from which port all shipments of ore are made.

The railroad is of thoroughly modern construction from engineering, operating and maintenance standpoints, and is equipped, both at Ojos Negros and at Sagunto, with excellent facilities for handling the ore and dealing with the traffic. The railroad is a single-track line of one-meter gage, but a considerable portion is graded and tunneled for two tracks, in such manner and such locations as to render possible the doubling of the traffic capacity at comparatively little expense. All ore is transported to Sagunto in steel hopper cars arranged to discharge themselves by gravity. The cost of transporting ore from the mines to

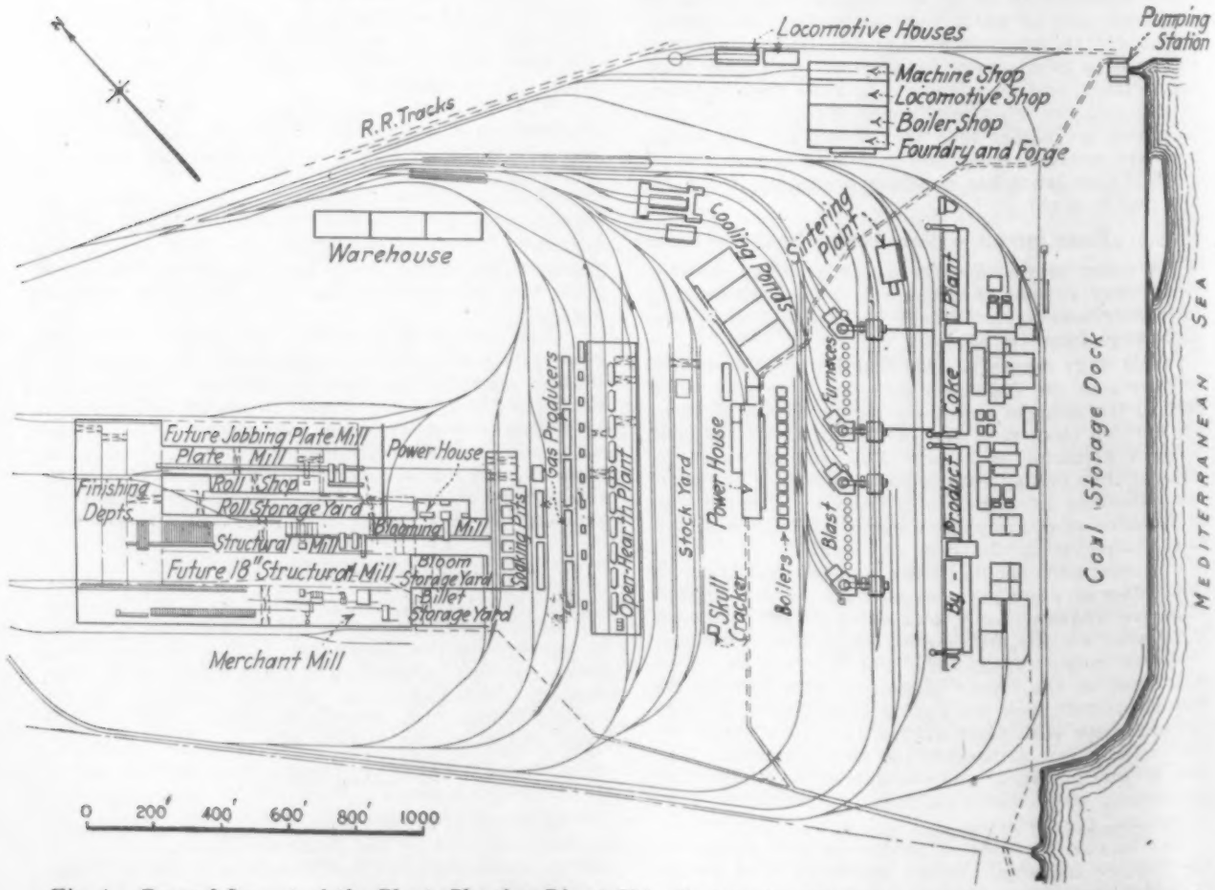


Fig. 1. General Layout of the Plant, Showing Direct Ship Contact for Delivery of Fuel and Logical Flow of Materials from Seaside to the Northwest. The railroad tracks are from the line bringing ore from the nearby mountains

Sagunto is very low, by reason of the grade being in favor of the load.

The Manera Mountains rise from comparatively level plains on each side. The ore lies along the faces of each slope and on the summit, in some instances, extending in relatively continuous layers, from points below each plain, up each slope and over the summit. In most cases the ore on the summit lies between quartzite, while on the slopes the ore is exposed, and is underlaid and penetrated by dolomitic limestone. Isolated masses of so-called carbonate ore are found in the deposits, but in reality this ore is not a carbonate in the strict sense of the term, but is a mixture of calcite and ore, its quality varying through a considerable range, according to location.

The volume of ore now exposed is great, certainly many million tons, in addition to which there are vast deposits which have been explored but not mined.

Ores About 50 Per Cent in Iron

In all there are some 25 divisions or deposits embraced in the property. Chemically, the ores from the various deposits are quite similar, carrying generally from 47 to 54 per cent iron and high in manganese; the latter varying from 0.67 to 1.76 per cent. Physically, the ores on the Guadalajara side are generally harder than those on the Teruel side of the mountain range. The latter ores are a mixture of lumps and very fine, are screened at the mines and separated into "lump" and "fines" before shipment. The so-called carbonate ore is generally a hard ore and, being of low iron content, is not marketed, but is utilized in the blast and open-hearth furnaces with great advantage.

On reaching Sagunto, the lump ore is either delivered to the blast furnace stock bins or is transferred to ocean vessels. In the latter event, the railroad cars are lifted to the top of a gantry, whence the ore is discharged by gravity into the vessel. This gantry is located on a pier extending into the Mediterranean a distance of 2200 ft., at right angles to the shore. The fine ore, on delivery at Sagunto, is either nodulized, briquetted or sintered in plants owned and operated by the company, the product being either shipped by ocean vessels or utilized at the blast furnaces.

Sagunto is the natural site for the construction of a works to utilize these ores, because it is the seaboard terminus of the railroad leading from the mines. It is provided with a pier and breakwater of ample dimensions to furnish accommodations for ocean vessels and for the protection of the harbor.

Coal Supply

The main supply of coal comes from other countries, chiefly Great Britain, and is generally shipped as return cargo in vessels carrying ore on their outward voyage. For some purposes it has been found advantageous to use coal from Northern Spain as a mixture with British coal, but the percentage of Spanish coal used in the works is relatively small.

General Arrangement of Works

FIG. 1 shows the general plan of the completed works. The following units already have been built and placed in operation: Two blast furnaces, with by-product coke plant, three open-hearth furnaces with a fourth in course of construction, the blooming mill, the combined rail and structural mill, the merchant mills and the plate mill. The construction of the remaining units will be undertaken in succeeding stages, the intention being to bring the blast furnace and open-hearth production up to the production capacity of the rolling mills, which is now in excess of the former.

All yard and works tracks are of one-meter gage, to correspond with the railroad leading to the mines, and the switching is performed by electric locomotives arranged to operate according to requirements, either from overhead trolley or storage batteries.

Coal is delivered by vessels alongside the dock, which lies immediately in front of the coke plant. The vessels are unloaded and the coal delivered to storage or railroad cars by specially designed locomotive cranes. Ore is delivered in steel hopper cars direct from the mines to the blast furnace stock bins. Shipment of manufactured product may be made either by water or by the Norte Railway. It will be noted that the arrangement of plant provides "through" tracks for all departments.

Water Supply

Fresh water supply for all departments of the works is taken from water-bearing gravel beds underlying the site, there being no river or lake supply near Sagunto. It is necessary to treat the "make up" water for the boilers, to remove its hardness. The fresh water supply is reached by two wells, one located near the blast furnace power house and another adjacent

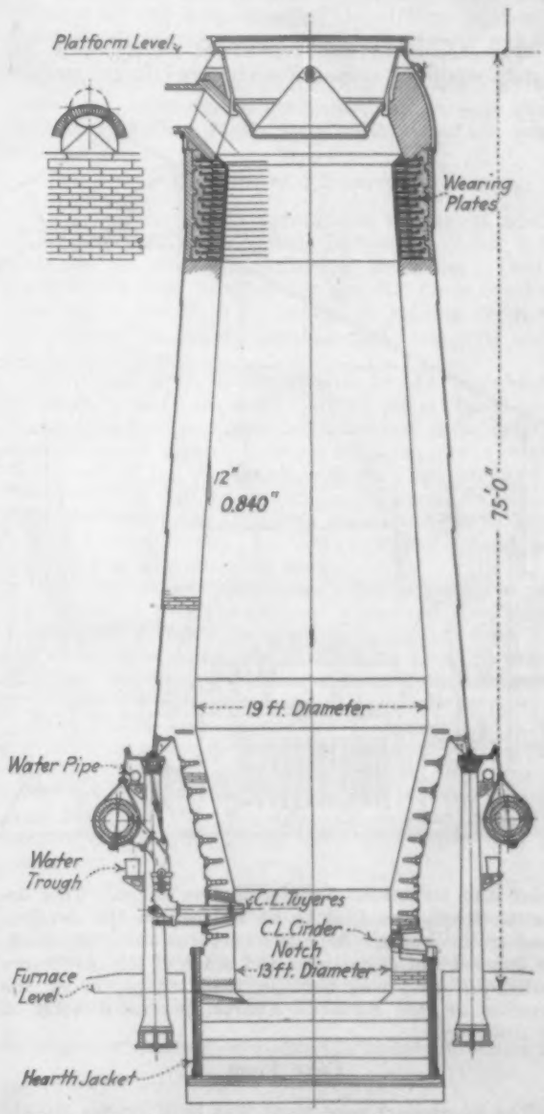


Fig. 2. Section of One of the Four Blast Furnaces. At upper left is shown the downcomer opening, from inside of furnace, indicating the location and arrangement and relative sizes of the wearing plates. The two upper tiers have 16 plates each; the smaller plates in lower tiers number 32 per circumference. The plates occupy a vertical height of about 8 ft. 5 in., having an inside diameter of 14 ft. 3⅞ in. at the lower edge and 13 ft. 6 in. at the stock line

to the blooming mill. The former supplies the coke plant, blast furnaces and steel works, while the latter supplies the rolling mills. The water required by the blast furnaces and steel works, exclusive of the necessary waste, is recirculated through cooling ponds equipped with spray nozzles. Channels lead the water from the cooling ponds to the circulating pumps, the required "make up" water being pumped into these channels from the well.

Electric turbine circulating pumps deliver the water to a steel standpipe, the design of the pumps

being such that they cease delivery of water when the standpipe is full, but continue in operation ready to supply any deficiency. The water required by the rolling mills is pumped into a separate standpipe for distribution; this water is not recirculated, but passes into the sewer system. Sea water is used for steam condensing purposes and is delivered by low head electric pumps, located at the north end of the works, into a waterproofed channel leading to the power house, where it is taken by the condenser pumps and discharged through the condensers, to the sewer system. The sewer system discharges into the sea at the extreme south end of the works.

Shops

The shop department consists of the following completely equipped shops: Foundry and forge, machine, boiler and structural and locomotive shops. This department was the first to be finished in the development of the works. All the structural and plate work, the general run of castings and much of the machinery equipment, etc., was built in these shops, under the direction of Don Eduardo Aburto, general director of the company.

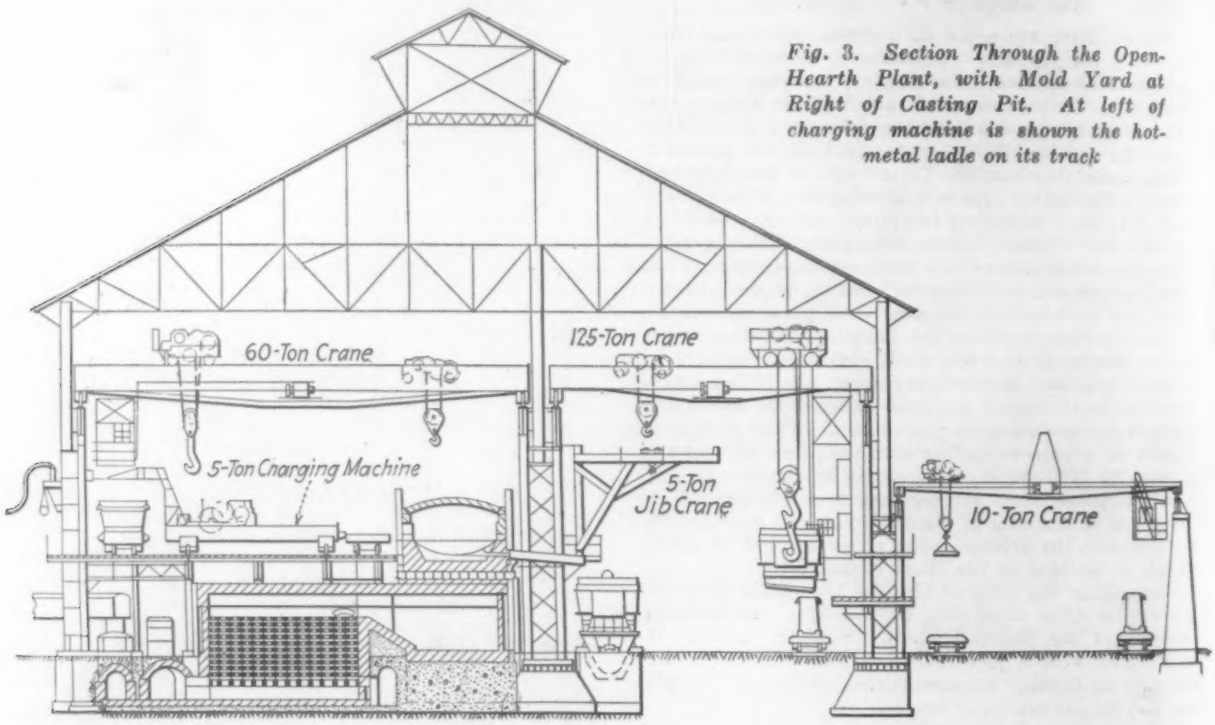


Fig. 3. Section Through the Open-Hearth Plant, with Mold Yard at Right of Casting Pit. At left of charging machine is shown the hot-metal ladle on its track

Coke Plant

The by-product coke plant was built by the Société de Distillation des Combustibles, Paris, France. The complete plant contemplates four batteries of 70 ovens each, and a total daily production of 1400 tons of 30-hr. coke. The first installation consisted of 70 ovens, of the "Hurez" type, 32 ft. 10 in. long by 8 ft. 2½ in. high, with widths of 21¼ and 18¾ in.

Conveyor belts are utilized to transfer coal to the pulverizing plant and from the latter to the storage bins. Likewise, coke is delivered to the blast furnace coke bins by conveyor belts.

The by-products department embodies equipment for the extraction of sulphate of ammonia, benzol and tar.

Four Blast Furnaces

FOUR blast furnaces are each of 300 tons daily capacity, the selection of this capacity having been due to a careful analysis of commercial conditions. The dimensions of the furnaces are as follows: Hearth, 13 ft.; bosh, 19 ft.; stockline, 13 ft. 6 in.; and height, 75 ft. No difficulty is experienced in producing more than the 300 tons per day for which the furnaces were designed. The height of 75 ft. was adopted, to avoid high blast pressure, with its consequent consumption of power and losses in flue dust, due consideration being given to the presence of "fine" ore in the furnace burden.

Fig. 2 shows the design of the blast furnaces.

The hearth construction consists of a vertical steel plate jacket with water-cooled cast iron plates between the latter and the brickwork. The bosh structure is composed of a continuous bosh jacket carrying openings for bronze bosh cooling plates, and extending from the top of the hearth jacket to the mantel, provision being made for vertical expansion. The stockline is protected, for a vertical distance of 8 ft. 6 in., by high-sulphur cast iron plates. Six 3-ft. diameter gas outlets are provided at the top of the furnace, these in turn being connected to the downcomer leading to the main dust catcher. From the latter the gases pass to a dry centrifugal dust collector, and thence to the gas mains. The furnaces are filled by double electrically operated skip hoists, delivering into Roberts revolving charging equipment. The electric hoists were built by the Otis Elevator Co. The furnaces are lined with the Olive Hill brand of fire brick, made by the General Refractories Co.

Stoves, Boilers and Power House

Each furnace is equipped with four 21-ft. x 90-ft. Roberts two-pass fire brick stoves, with an independent chimney for each pair of stoves.

The boiler plant is composed of Babcock & Wilcox boilers equipped with superheaters and arranged to be fired with blast furnace gas, coke oven gas, coal, or combinations thereof. The steam pressure is 175 lb. per sq. in. Provision is made for the future installation of economizers.

The power house at present is equipped with three turbo-blowers, each having a capacity of 30,000 cu. ft. per minute, and three 3750-kva., 5250-volt, turbo-electric generators, with the necessary auxiliaries, to supply 220-volt direct current for the coke, blast furnace and open-hearth plants. The entire power house equipment, except the steam piping, was furnished by the Brown Boveri Co. of Switzerland; the piping was supplied by W. M. Anderson of Philadelphia. The power units are steam driven, fitted with surface condensers,

designed for the use of sea water as the condensing medium.

Handling of the Burden

The stock bins are built of stone masonry. The ore and limestone bins deliver by gravity into electrically operated hopper transfer cars equipped with scales, which cars in turn discharge into the skip cars. The bin gates are hand operated by mechanisms carried by the transfer cars. The coke bins, located in front of the skip hoists, discharge over screens direct into the skip cars. Coke is transferred from the coke plant to the coke bins by means of conveyor belts, provision also being made for delivery of coke to the coke bins by rail.

Ore is not stored in quantity at the works. In lieu of the usual large ore storage piles, the ore mines are utilized and are found to meet all requirements in this respect, due in large measure to mild weather conditions and the control by the company of the railroad leading to the mines.

A sintering plant consisting of two Dwight-Lloyd machines is located adjacent to the stock bins. The materials to be treated are delivered to the stock bins by rail and thence to the sintering plant by conveyor belts. The sinter is transferred to the stock bins by rail.

Hot metal from the blast furnaces is delivered into ladles of the Pollock short-pour type, and transferred to the steel plant or to the pig casting machines, as may be desired. The latter consist of double strand Heyl & Patterson equipment. Automatic recording track scales are provided, for weighing the hot metal.

Open-Hearth Steel Plant

NOMINALLY of 60-ton capacity, the open-hearth furnaces have hearths 32 ft. long by 14 ft. wide, measured at door sill level. The gas and air regenerator chambers are 25 ft. in length with a width respectively of 7 ft. 6 in. and 12 ft. 6 in.; the height of checkers in all chambers is 10 ft. 9 in. The width of the open-hearth building, center to center of columns, is 137 ft.; 79 ft. of this width provides for the furnaces, charging floor, etc., while 58 ft. is devoted to the casting floor. The reversing valves and furnace doors are operated by hydraulic power.

A 60-ton charging crane covers the furnaces and the charging floor and a 125-ton ladle crane spans the casting floor. In addition, a 20-ton "clean-up" crane serves the casting floor and a 5-ton jib crane is provided on the pouring side of each furnace. A mold yard, equipped with a 10-ton crane, adjoins the casting floor side of the open-hearth building. The charging machine is a 5-ton low-type unit. The cranes and charging machine were built by the Alliance Machine Co.

A 600-ton mixer, built by the Pennsylvania Engineering Works, is located in the end of the building; the mixer is heated by oil-burning equipment. Hot metal from the blast furnaces may be delivered direct to the charging floor and thence to the open-hearth furnaces by the charging crane or, when destined for the mixer, to the casting floor and thence by the ladle crane to the mixer. Metal is poured from the mixer into a ladle resting on a scale, is weighed and then transferred by the charging crane to the open-hearth furnaces.

Fig. 3 is a cross section through the open-hearth building, furnaces, etc.

Provision is made in the design of the open-hearth furnaces for the installation of the McKune system of piping, equipment, etc., for burning coke oven gas and tar.

Each furnace is equipped with a Babcock & Wilcox waste-heat boiler and superheater; the surplus steam from these boilers passes to the blast furnace power house.

Hand-Poked Producers

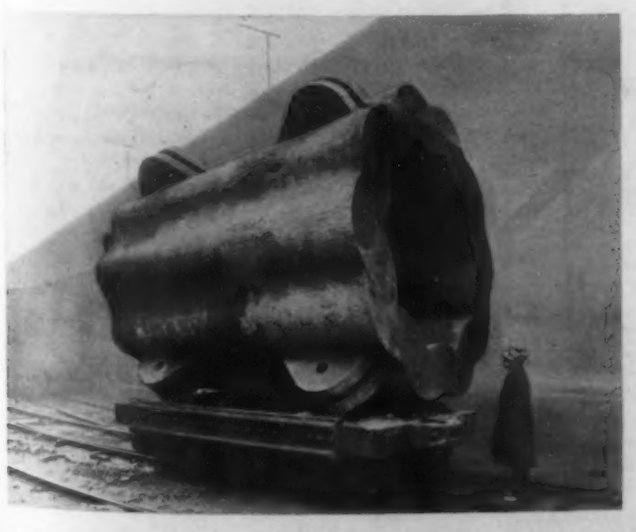
Gas producer plants throughout the works consist of hand-poked, water-sealed producers. Low labor costs did not warrant mechanical producers. Coal is delivered to each producer by gravity from overhead bins, which are filled by conveyors leading from the coal hoists; the latter take the coal from bins under the railroad track.

The stockyard, placed parallel to the open-hearth building, is 90 ft. in width. Its 10-ton Alliance crane is equipped with a magnet, a bucket and drop balls for breaking small scrap. A larger skull cracker is located at one end of the stockyard. An ore pit is provided in the stockyard into which ore is delivered by bottom dump railroad cars, and from which the ore is taken by the bucket carried by the overhead crane and dumped into the charging boxes.

The open-hearth plant and equipment are designed for the use of the "pig and ore" system of steel manufacture, the standard mixture being 90 per cent iron and 10 per cent scrap. In practice the average weight of ingots per heat is 75 metric tons, and the number of heats per week varies from 14 to 18 per furnace.

Due to the high percentage of manganese in the pig iron, the mixer does remarkable work in the elimination of sulphur. At times, owing to blast furnace irregularities, the latter has run as high as 0.10 per cent, but, even then, no difficulty was experienced in keeping the sulphur in the steel well under 0.04 per cent.

In a subsequent issue will be published the story of the rolling mill equipment, beginning with the soaking pits and blooming mill and covering the rail and structural mill, the plate mill and the merchant mills.



Large Ingot Mold Cast by Bethlehem

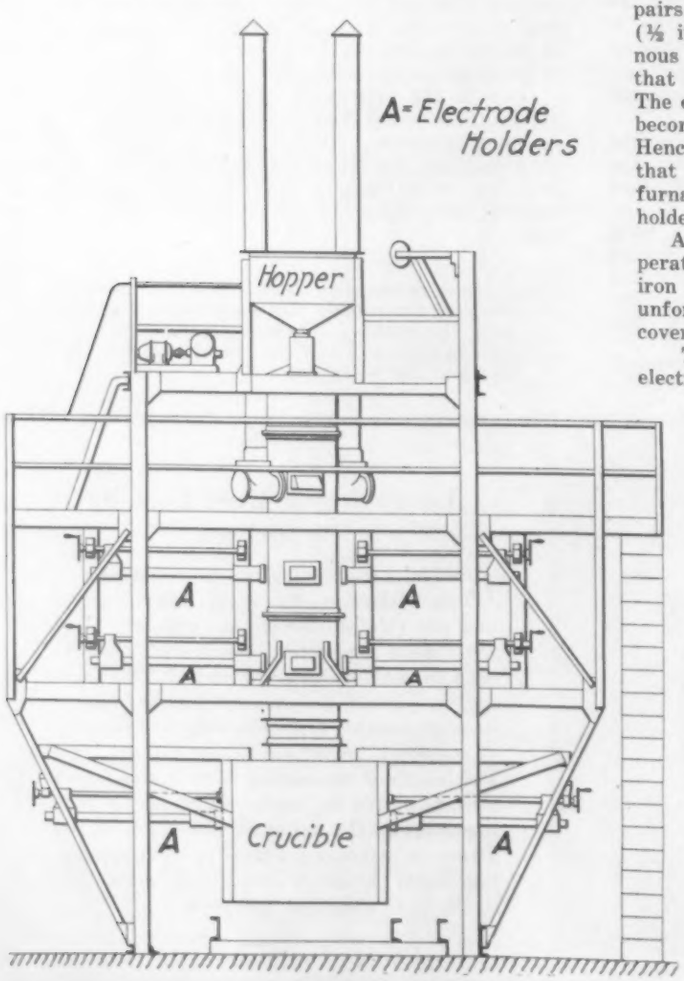
BETHLEHEM STEEL COMPANY, at its Bethlehem, Pa., plant, has completed and put into service an exceptionally large ingot mold for casting ingots which will be used in making large forgings. This casting, as poured, weighed 387,590 lb., with a finished weight, after cleaning and removal of sinkhead, of 382,000 lb., or 191 net tons. The length of the casting is 15 ft. 6 in., with a width of 108 in., measured across the corrugations at the top of the mold, and 97 in. across the concave portions of corrugations. The ingot produced from this mold will weigh, with sinkhead, 247 tons.

Direct Reduction of Iron Ore

Dutch Method Avoids Blast Furnace—Electricity Used in Reducing Iron Sands—Crushed Ores to Be Handled

AMONG the several methods which have been proposed for obtaining metallic iron without the use of any form of blast furnace, a scheme which has been put into experimental practice in England has several interesting points. It is the invention of D. Croese, a Dutch engineer. His present method is being applied to the reduction of iron sands through the use of electric current. He believes, however, that it can be applied equally well, after some experimental development, to ordinary iron and other ores after they have been crushed. The English plant is located at the Electro Thermic Works, Cobden Street, Luton, Bedfordshire. The inventor's British patent is No. 22762/26.

Mr. Croese's early experiments on iron sands in Java produced nothing but slag. He found that the material contained titanic acid, which requires a much higher temperature for its reduction than iron ore. Consequently, he turned to electricity as the means of obtaining the necessary high temperature. The experimental results at Luton are reported upon by Dr. Gulliver, metallurgical engineer of David Kirkaldy & Sons, Testing and Experimental Works, 99 Southwark Street, London, S. E. Dr. Gulliver says, in his report, "We consider it to be established that steel and cast iron, of any normal content of carbon, can be prepared by the process employed."



FRONT of Furnace, Showing Locations of the Several Electrodes with Relation to the Crucible. There are three electrodes at each side in the crucible and one at each side in each of the two positions in the shaft. The unit has a width of 20 ft., exclusive of the stairs, and the motor is about 20 ft. off the floor. The crucible may be rotated, as well as rocking it to tap the metal

Finely divided ore from the crusher and grinder falls through a vertical furnace chamber, which may be built up from a number of super-imposed units. The height of the chamber may be varied in accordance with the time necessary for the satisfactory treatment of a particular ore. Baffles intercept the fall of the crushed ore, forcing it into controlled streams and retarding its speed through the furnace.

Ordinary ores without the titanic acid inclusion will melt so readily that the electric arc is not required. Gases may be employed for their reduction. In particular, an oil gas is recommended by Mr. Croese, which has a flame temperature several hundred degrees above that required for reducing ordinary iron ores. He believes that this gas furnace could be made not only high enough to obtain killed metal in the crucible, but also of sufficient diameter to give a large daily production of metal.

Experimental tests on the electric process, made in Germany by Gebrueder Fabke, Fabrik Elektrischer Maschinen und Apparate, 162 Hammerlandstrasse, Hamburg, resulted in the following report (freely translated):

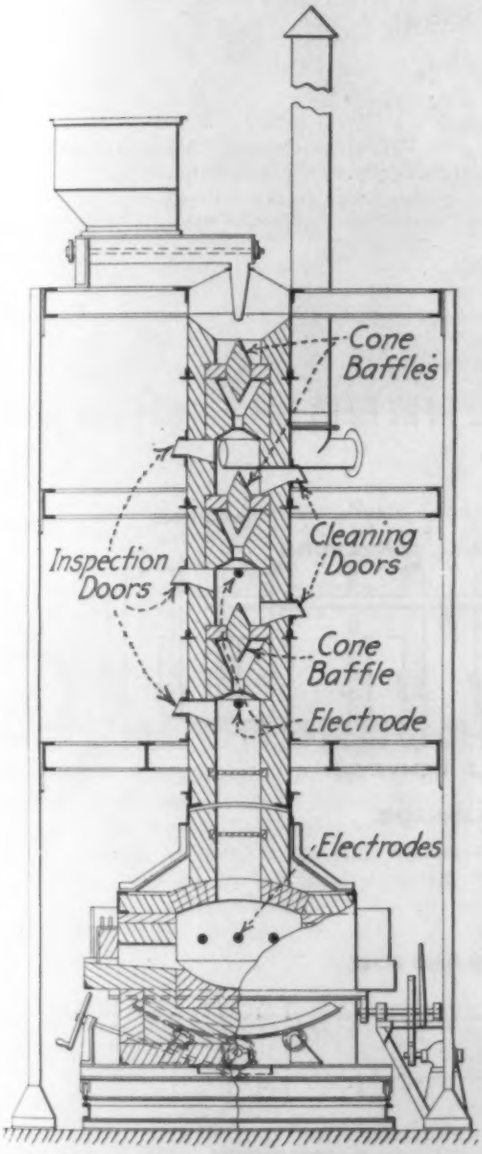
First Attempts to Smelt Iron Sands in the Experimental Furnace

The provisional furnace is equipped with three pairs of protected carbon electrodes of 13 mm. (½ in.) diameter, regulated by hand. The luminous arc does not persist, hence it is essential that electric automatic regulation be provided. The electrodes, during heating up of the furnace, become incandescent over their whole lengths. Hence water-cooled holders must be employed, so that only the part of the electrode inside the furnace will be incandescent, and in the exterior holder it will be cooled.

After ½ hr. the furnace had reached a temperature fit for smelting. On introduction of the iron sand, it melted in 3 to 5 sec. The slag is, unfortunately, a third as much as the iron recovered.

The furnace has the fault of having too few electrodes in the lower part. Thus the iron stif-

fens in the slag and is no longer fluid. Particularly highly heated electrodes must therefore be arranged for, in the lower portion of the furnace, to make possible the flowing of the metal and the slag. The crucible, in which the metal is to separate, must, also, be highly heated. For smelting, then, six carbon electrodes must be em-



SECTION of Shaft and Crucible, Taken at Right Angle to the Front View on opposite page. Inspection and cleaning doors are fitted with mica peep holes. The cone baffles retard the falling movement of the charge and thus subject it for a longer time to the action of the current

ployed which take 20 amperes of current per pair.

As the material has a falling velocity of 9.8 m. (32 ft.) per sec., vertically, a practical furnace must be fitted up so that the material has a length of some 36 m. (118 ft.) in which to fall.

If the material is permitted to roll over oblique conical surfaces, the necessary length is halved. Hence an 18 m. (59 ft.) channel is brought, in the newest furnace construction, provided with 8 cones, to $\frac{18}{8} = 2.25$ m. (7.4 ft.) long.

As we, however, have further established that the material should flow under four electrodes, it runs in the new arrangement half again as slowly. And with $\frac{2.25}{2}$ or 1.125 m. (3.7 ft.) length of smelting furnace, one easily obtains flowing metal.

It is assumed that the lower part is strongly heated, and that the lower tuyeres are heated to a higher temperature than the upper. The problem of the electric blast furnace on the Croese process will be thus solved, according to our conviction. Quick changing of the electrodes can be undertaken without interrupting the process.

French Views of American Foundries

Two members of the French delegation participating in the foundry congress at Detroit last fall told of their impressions at a meeting held Dec. 16 by l'Association Technique de Fonderie at l'Ecole Nationale d'Arts et Metiers de Paris. H. Magdelenat, vice-president of the association, discussed the equipment and arrangement of American foundries, and L. Montupet took up the subject of aluminum foundries and the use of light alloys in the United States. The following is taken from *L'Usine*, of Paris.

"A French foundryman," said Mr. Magdelenat, "is struck on arriving at an average American installation by the attractiveness of the leading buildings designed for the single purpose. Great importance is attached to the use of a traveling crane which can handle raw materials, control the stocking of them and carry them to a charging platform in the cupola." The speaker described some of the methods now widely employed in this country for substantially complete mechanical charging of the cupolas. He dwelt at some length on the sand handling apparatus, and the rapid handling of hot iron, the general use of molding machines and the shaking-out upon agitated and ordinary gratings.

The principal points which make for the superiority of the American foundry, he said, were the use of material handling machinery to an extent not followed in France, and mass production, with a flow of work through the plant which makes for small stocks of material, correspondingly small capital charges and diminished fatigue among the workers; also he emphasized as important the fact that wages are proportioned to efficiency, with broad recognition that the more money a worker gains the more important he becomes as a consumer. The speaker also mentioned the effort to reduce industrial waste to the extreme, and he found laboratory and research organizations very well developed, and attributed American successes also to the habit among industrial managers to exchange their experiences with a retention of no manufacturing secrets among them.

Mr. Montupet mentioned that of 100,000 tons of aluminum produced annually by the Aluminum Co. of America, representing one-half the world production, some 40,000 tons are utilized in the automobile. He suggested that the fact that Americans use cast iron widely in place of aluminum in the automobile is because the output of aluminum is still insufficient, and then again the question of weight of motor cars is of less importance in the United States than in France. It is evident, he added, that in the near future Americans will make the use of aluminum general. He thought it was interesting that the light alloys are widely employed in heavy motor trucks.

American aluminum foundries, he said, showed installations embodying the last items of perfection both in respect to modern molding, technology and wide uses of mechanical handling. He mentioned finding large numbers of Osborn type molding machines.

Supplementary compensation amounting to $1,358,670 was distributed during February to 30,518 employees of the General Electric Co. who have been associated with the company for five years or more. The distribution was based on 5 per cent of the employee's earnings during the six months ended Dec. 31, 1926. Schenectady employees received $452,490.

Molding and Sand Costs Reduced

Continuous Mold Conveyors and Sand Handling System Yield Economies at American Radiator Co. Plant

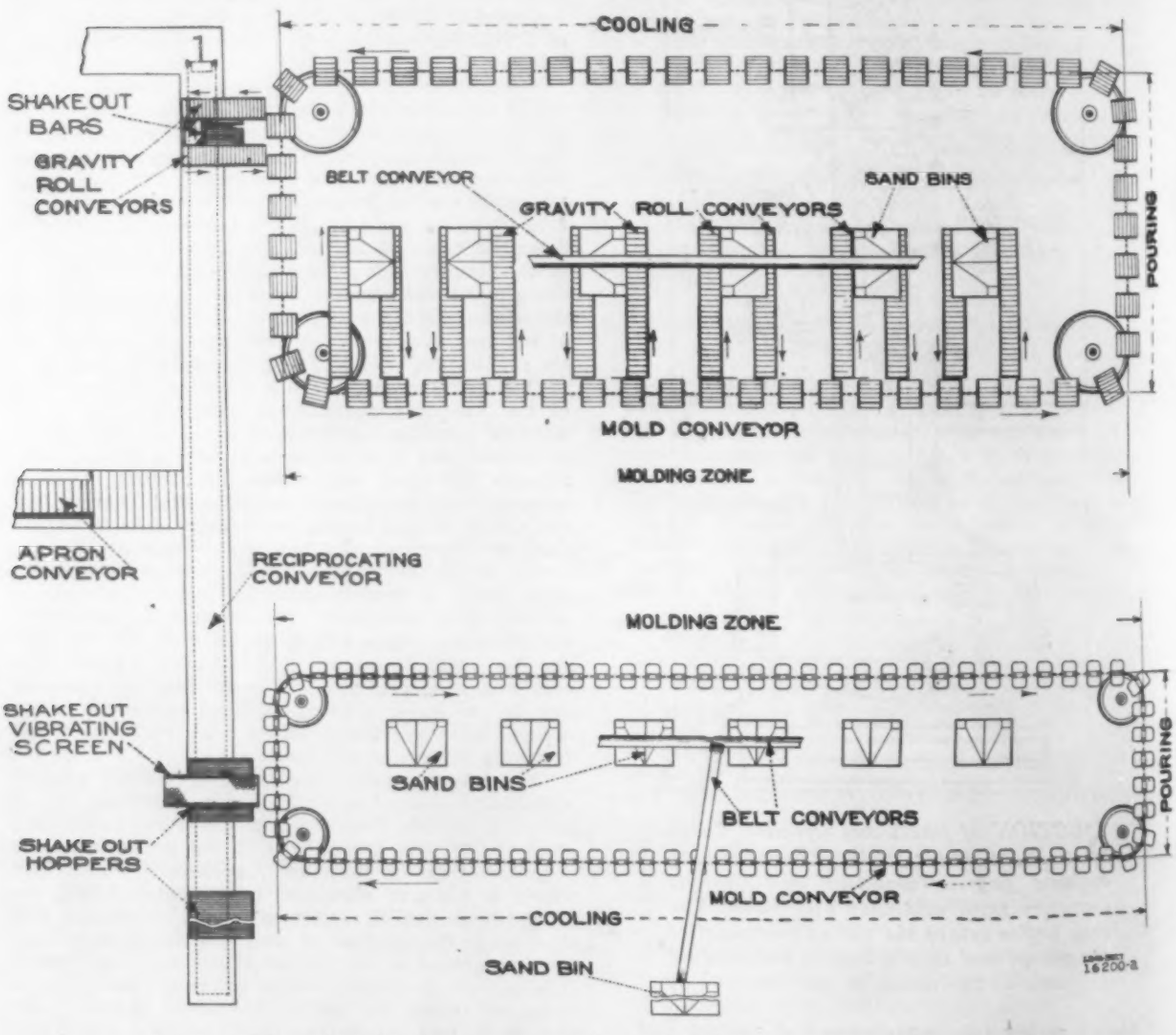
BY R. J. HEISSERMAN*

NEW sand and mold-handling systems at the Bond Plant of the American Radiator Co. at Buffalo have now been in operation for over a year. The sand-handling equipment and the mechanical molding system, consisting of two power mold conveyors, were installed by Link-Belt Co., Chicago, Philadelphia and Indianapolis, and have given continuous service without any change being necessary in the original layout. At the same time, a higher production than was originally figured has been attained.

A comparison between the old floor method of molding and the mechanical means, whereby all the lifting, carrying out, shoveling and back-breaking labor have been practically eliminated, follows:

Production of Molds per Man-Hour—Old Method

Small Davenport Unit	Snap Flask Unit	Maintenance Cost per 1000 lb.
5.75	18.25	$1.80



Plan View of Mold Conveyors, the Larger One Being Shown at the Top

Production of Molds per Man-Hour—Mechanical Method

Small Davenport Unit	Snap Flask Unit	Maintenance Cost per 1000 lb.
9.70	30.55	$1.47

1. A 50 per cent saving in floor space is obtained by the mechanical method.

2. The conveyors require only 25 per cent of the flask equipment formerly used under the old method.

3. The possibilitiy of running two, or even three, shifts

*Engineer Link-Belt Co., Chicago.

THE Smaller Mold Conveyor Has a Capacity of 375 Snap Flasks Per Hr. at 18 Ft. Per Min. The speed range is from 12 to 24 ft. per min. Suspended from above are duplex gates with deflector chutes from molding sand hoppers

THE Trays on the Larger of the Two Mold Conveyors Are Sections of Gravity Rolls. Lifting is eliminated, since the molds are rolled by the molders directly from stationary rolls to the trays. The conveyor can handle 200 molds per hr. at 10 ft. per min. Its speed, however, may be varied from 6 to 12 ft. per min.

THE Trays on the Smaller Conveyor, Which Slide Directly on Greased Rails, Are Spaced 27 In. Apart. They are propelled by a rivetless chain

a day, in which case maintenance and investment costs are greatly reduced, is offered.

4. The night labor of shakeout sand-preparing men is no longer required.

5. Storage of rough castings is eliminated, as they proceed in a continuous flow to and through the cleaning and machining departments.

The mechanical method has other advantages over the old floor method, such as better labor conditions resulting from less turnover; better and more economical melting and pouring conditions, due to the pouring being continuous; better sand, resulting in a finer finish on castings.

The two power mold conveyors run in a horizontal plane. The larger one travels in a rectangular path 68 ft. on center line in the long direction and 21 ft. 3½ in. across. It is equipped with trays, made up of sections of gravity rolls, 21 in. wide x 40 in. long. On the bottom of the rolls are attached hard white iron wearing shoes, which travel and slide on T-rail tracks.

Propulsion is by a single strand of No. 998 Link-Belt rivetless chain, suspended from the bottom of the trays by special long joint pins with cotters. In this way, while the chain is propelling the trays, the trays are supporting the chain and thereby eliminate any necessity for tracks, guides or rollers for the chain. The trays are spaced every 42 in. and travel at a speed of 14 ft. per min., which gives a resulting capacity of 200 molds per hr. if all trays are filled.

The conveyor is driven at one corner by a 10-hp. motor. The motor is belted to a reducing set, which drives a vertical shaft through a set of cast steel bevel gears. By actual readings 6 hp. is consumed by the conveyor. A takeup shaft is located at the corner nearest the drive shaft, while at the far end of the conveyor are two plain turn shafts.

All sprockets for the rivetless chain are cast iron, 81 in. pitch diameter, with a circular T-rail track attached to the top to carry the inside end of the trays in going around the corners.

The molds carried on the conveyor measure 16 in. wide x 34½ in. long x 7 in. deep and are made in cast iron and steel flasks on six roll-over and six stripper Davenport molding machines, which are operated by 16 men, including the core setters and clampers-up.

Two short sections of gravity conveyor run on each side of a given set of molding machines. On one the molds are cored, closed and delivered to the power conveyor, while the other is for returning the empty flasks to the molding machines from the power conveyor.

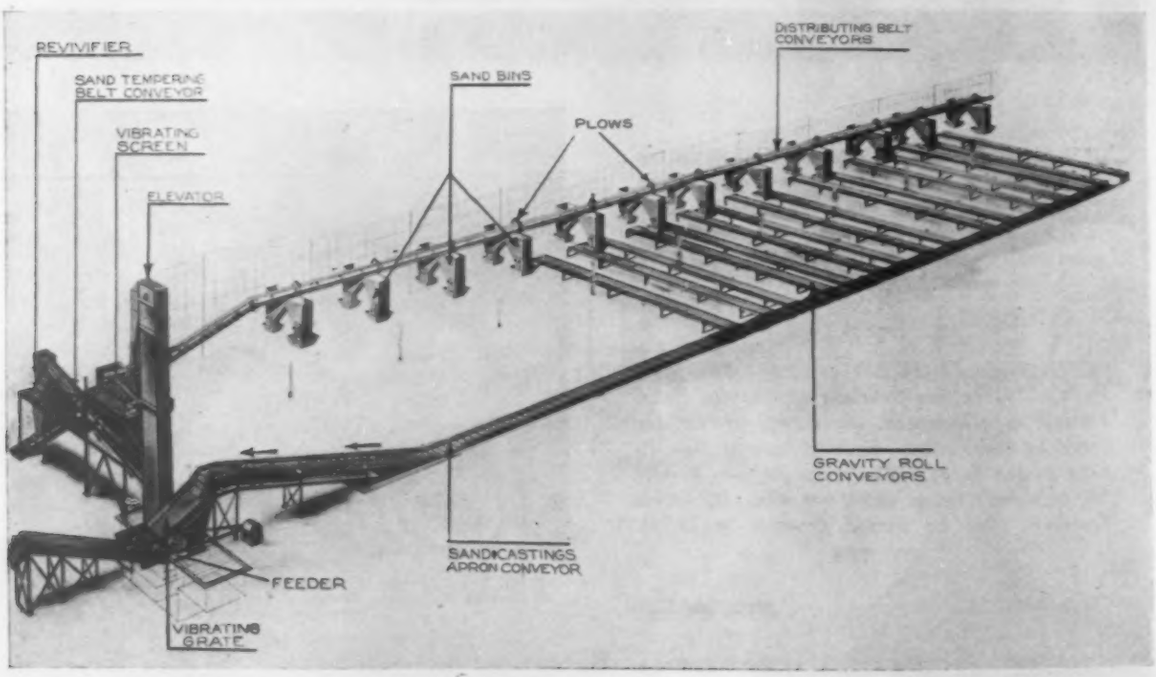
After the mold is clamped, it is pushed from the stationary gravity conveyor to the roll trays on the power conveyor. This arrangement, obviously, makes it unnecessary to lift the mold in transferring it to the power conveyor and as the transfer is made with the power conveyor in motion, no time is lost.

The molds, after being placed on the power conveyor, travel to the pouring end, where two men pour off as the molds pass. During the travel from the pouring zone to the shakeout end, the molds are cooled, and just after they have turned the driving sprocket, they are manually pushed on a short section of gravity conveyor at one side of the shakeout grating. Here two men break open the molds, and as the two halves are shaken out, they are placed on a second section of gravity conveyor, by which they are returned to the power conveyor by a man at that point.

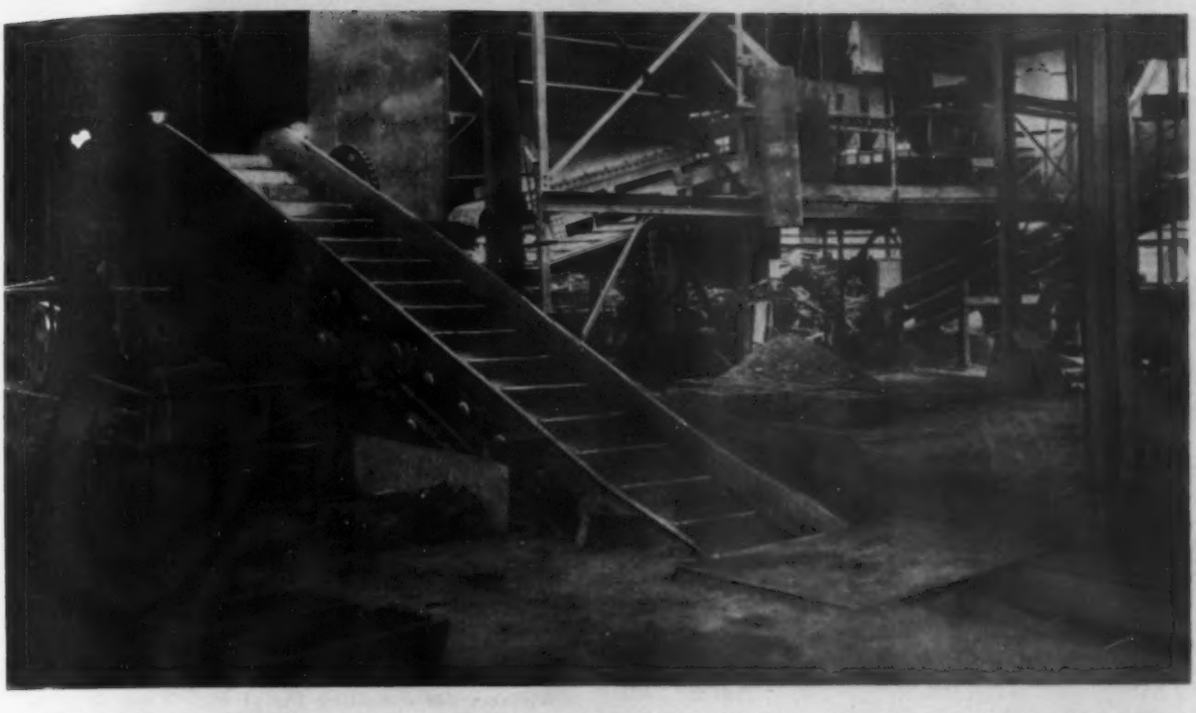
The castings are hooked out by a worker when the cope has been removed, and there are several other workers there for removing castings to a castings conveyor and for cleaning up.

The empty flask with bottom boards now travels back on the power conveyor to the molding stations, and as it passes the molder using that particular flask, it is pushed off the power conveyor to the flask storage gravity conveyor alongside of each pair of molders. One man traveling along the side of the power conveyor takes care of this operation.

On the side of the foundry opposite the conveyor described above, is the power mold conveyor for



PERSPECTIVE View of Continuous Sand System. Sand and castings are carried on an apron conveyor, shown in the foreground, the sand being shaken through a vibrating grate and then carried up an elevator that serves the sand reconditioning equipment. The castings pass over the grate to a short inclined conveyor for final delivery. In the background is one of the distributing belt conveyors that carries the reconditioned sand to the hoppers over the molding machines



END of Sand and Castings Conveyor, Where It Discharges Sand Into an Elevator That Serves the Sand-Reconditioning Equipment. The prepared sand is carried up the incline, shown in the right background, to a molding sand conveyor

handling molds, 12 in. wide x 16 in. long x 5 in. to 8 in. deep, both of the snap and the steel flask variety. This conveyor is similar in construction to the other, with the following exceptions:

The path of travel is 72 ft. long x 11 ft. 6 in. wide, and the trays are hard white iron castings sliding directly on the T-rail tracks. The tracks are greased once a day, and judging by the wear resulting from the first year of service, they should last at least four years. The trays are spaced 27 in. apart and travel at a speed of 20 ft. per min. The corner sprockets are 57 in. pitch diameter, and a 7½-hp. motor furnishes the power. The actual horsepower consumption is 4.2 hp.

Twelve molders working on 12 squeeze-type molding machines place the completed molds directly on the power conveyor. Just before the molds turn the corner into the pouring zone, a man stationed at this point places a weight on top of them. Two men do the pouring as the molds pass across the 11½-ft. side of the conveyor, and, surprising as it may seem, they do this work at the high speed that the conveyor travels without the aid of a moving pouring platform. The ladles used hold about 250 lb. of iron and are suspended from an overhead track with a chain block. About 5 sec. are required to pour each mold.

After the molds have turned the next sprocket, or

SAND and Castings Apron Conveyor, Passing Under the Ends of Stationary Gravity Rolls That Serve Some of the Molding Floors. The capacity of the conveyor is 15 tons of castings and 60 tons of sand per hr., and its speed is 20 ft. per min.

corner, and have started along the cooling side of the conveyor, weights are lifted off manually and placed on a section of gravity conveyor which returns them to the weight-placer on the opposite side of the power conveyor. The molds, after traveling the full length of conveyor, are cooled, and one man picks them up at the shakeout and dumps them into a Link-Belt vibrating shakeout screen, where the sand and castings are separated. The sand drops through to the shakeout grating, while the castings are discharged over the end into a wheelbarrow. Flasks, bottom boards and bands are again placed on the power conveyor trays and in this way are returned to the molder, who picks off those he wants as they come to his station.

Between the small mold conveyor and the wall is located a gravity conveyor molding unit, consisting of a roll-over and stripper and two lines of gravity roll conveyors. On one line of the gravity conveyor the molds are cored, closed, poured, cooled and conveyed to the shakeout hopper. The second line of gravity conveyor is used for returning the empty flasks to the molding machines and for the storage of flasks. This unit is for large heavy work of a miscellaneous character that cannot be made on either one of the two power molding units.

Shakeout Sand Conveyed to Reconditioning Equipment

Sand drops through the gratings at the three shakeout hoppers and then is fed uniformly by feeders on the bottom of these hoppers to a reciprocating conveyor, 36 in. wide x 87 ft. long. A 15-hp. motor drives this machine, and power readings show that 13.4 hp. is consumed. The reciprocating conveyor gives the sand a preliminary mixing and at the same time conveys it to the foot of an elevator

The elevator has a 37-ft. 2-in. center line and is made up of a belt, 16 in. wide, with 14-in. x 7-in. malleable iron buckets spaced every 24 in. The actual horsepower required to drive this elevator is 4.2, and a 5-hp. motor is installed. From the elevator the sand passes to a 4-ft. x 5-ft. Link-Belt vibrating screen, the screen cloth being No. 8 wire with ⅝-in. mesh. The screen is driven by a 5-hp. motor, 2 hp. actually being consumed.

Located directly beneath the vibrating screen is a collecting hopper with a capacity of 5 to 7 tons of sand, which is used to give a uniform feed of sand to the tempering belt. A gate is provided at the bottom of the tempering belt hopper so that the capacity can be regulated on the belt, and as the sand passes along, it is raked, tempered and raked again before it is discharged into a revivifier.

A magnetic separating belt has been installed over the tempering belt for drawing out small shot and particles of iron that have not been caught by the vibrating screen. The tempering belt, which is 24 in. wide and has 21-ft. centers, runs at a speed of 100 ft. per min. The next machine in the cycle of operations is a No. 18 Link-Belt revivifier, which is driven by a 15-hp. motor, which also drives the tempering belt. The actual power consumption on this motor is 11.3 hp.

The sand that is discharged from the bottom of the revivifier is collected on the foot end of the first of two distributing belt conveyors, which is 24 in. wide x 91-ft. centers. The conveyor carries the sand to plows that divert it into molding sand hoppers over Davenport molding machines.

Reworked Sand Distributed by Two Belts

One man is used for tempering the sand at the tempering belt and a second one operates the plows on the first distributing belt feeding the molding sand hoppers. When these hoppers are filled, the plows are raised and the sand is discharged over the end to a cross belt conveyor, 24 in. wide x 48-ft. centers, which discharges to the second distributing belt.

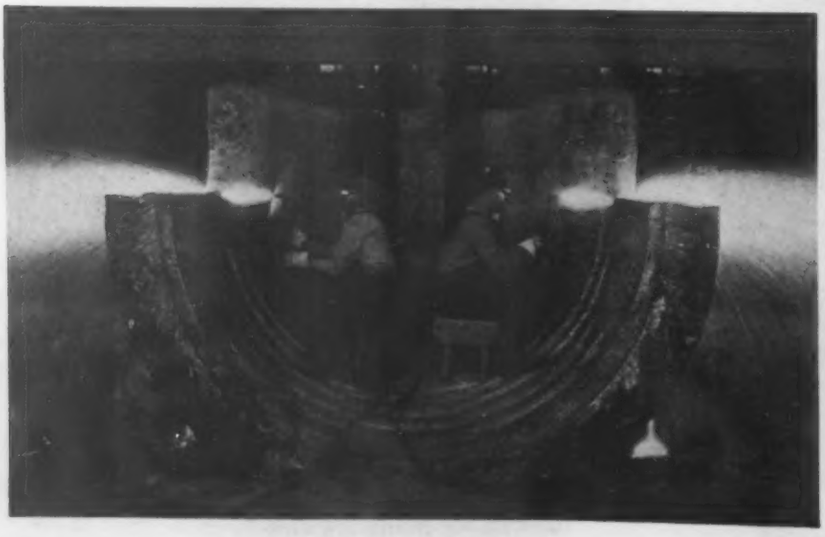
This distributing belt, like the other, has a man in attendance for operating the plows. When all of the bins are filled, sand passes over the discharge end and either goes back into the reciprocating conveyor or is used on some of the hand floors. The second distributing belt is 24 in. wide and has 73-ft. centers.

Sand for the small gravity roll unit against the wall is furnished from the second distributing belt by a belt conveyor 24 in. wide x 23-ft. centers.

The two distributing conveyors and the cross-belt conveyor are each equipped with a 5-hp. motor, and each consumes 3.5 hp. The short conveyor to the auxiliary molding unit is equipped with a 3-hp. motor, and readings show that it uses 2 hp.

Although there is very little sand storage in this system, there have been no difficulties experienced with hot sand and a very fine finish is obtained on the castings without the use of facing. All of the molding sand hoppers over the molding machines are equipped with duplex gates and are so located that the sand drops directly into the molds.

Although the sand system was designed for handling 60 tons per hr., it is often called upon to handle as much as 70 tons per hr.



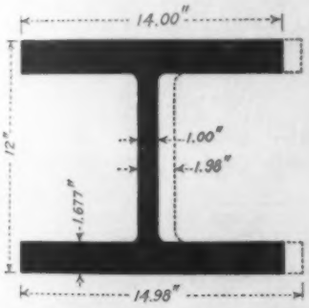
USING illuminating gas in the Everett plant of the General Electric Co., a 19-in. riser from a steel casting is cut through in 7½ min. The torch may be equipped with a superheater, it is stated, effecting marked economies in the amount of oxygen required by the cutting jet.

New Carnegie Structural Beams

Sections with Uniform Flange Thickness, Designed for Both Columns and Girders—Facility of Fabrication Stressed

STRUCTURAL steel beams and column sections in a wide variety are covered in a new series, descriptions of which have just been issued by the Carnegie Steel Co. in a 50-page pamphlet. One of the chief characteristics of the new sections lies in the fact that the flanges are of uniform thickness from edge to fillet. The fillets are of parabolic contour, in place of the usual circular contour, combining maximum spread of fillet with minimum area. The uniformity in flange thickness is stressed as increasing the strength of the section, permitting simpler connections and facilitating fabrication.

New sections are provided in a range from 8 to 30 in. deep, from 5 to 16 in. wide, in weights up to 305 lb. per linear ft., with section moduli about the major



Constant Depth Beam Made in Several Weights. The solid line shows the minimum section, with web 1 in. thick. The dotted line, with web 1.98 in. thick, is the maximum

axis up to 738 in.^{3}, and with radii of gyration about the minor axis up to 4.14 in.

Beams of Constant Depth

For particular use in columns two series have been developed, one of which is called a variable depth type and the other a constant depth type. The constant depth type presents an innovation in rolled steel column sections, in that the overall depth for all sizes of a nominal depth does not vary. This is expected to provide greater uniformity in many features in the construction of steel buildings.

The constant depth type is offered in 10-in. and 12-in. depths only, the 10-in. depth having flange widths from 8 to 13 in., and section weights from 31 to 140 lb. per linear foot. This series is stated to be sufficient for an ordinary 12-story building. The 12-in. series, in conjunction with the 10-in. series, will take care of an ordinary 18-story building. In the 12-in. series the flange widths run from 10 to 15 in., and the section weights from 75 to 230 lb. per ft.

Some of the characteristics of the constant depth beams make them very unusual in sectional appearance. Thus, a 12-in. beam weighing 230 lb. per ft. has a flange width of 14.98 in., a uniform flange thickness of 1.677 in., and a web thickness of 1.98 in. These flange and web thicknesses, especially are out of the ordinary.

Bethlehem and Jones & Laughlin Sections

Comparison will naturally be made between this new form of beam and two other forms which represent the latest practice of other steel makers. The Bethlehem H or Gray-beams are most similar to the new Carnegie sections. There is a sharp difference, however, in that the Bethlehem beams have tapering flanges, as with the ordinary form of I-beam with which we have long been familiar. Associated with these tapering flanges is a ratio of flange width to beam depth similar to that of the new Carnegie beams.

Jones & Laughlin junior beams are at the opposite end of the scale. These were designed particularly for a minimum weight, so that they might be used in light building construction, either by themselves or associated with beams of the usual type. In these beams there is no attempt to provide the great width of flange which characterizes both the new Carnegie section and the Bethlehem section.

Another characteristic difference lies in the fact that, with the Jones & Laughlin junior beams, only one flange width and one web thickness are provided for each depth of beam. This standardization results in a total of only seven different sections, with depths ranging from 6 to 12 in. In contrast with this, both the Carnegie list and the Bethlehem list show a large number of sections, varying not only in web thickness and flange thickness, but in flange widths and, in most cases, in depths of beam as the flange thickness increases.

To Be Rolled on a New Structural Mill

All of the new Carnegie sections are said to be produced on a structural mill of the most advanced type. The series provides a range of beam and column sections progressing by regular steps, with contours permitting the sections to be used interchangeably as beams or as columns. The introduction of 14-in. and 16-in. sections results in a progressive series in which each depth between 8 in. and 30 in. is approximately 15 per cent greater than the preceding depth. In addition, successive weights in each group are so arranged that their strengths progress by steps having close and approximately regular ratios of increase.

Rolls are reported now ready to roll constant depth sections with 10-in. depths and flange widths of 9, 10 and 12 in.; constant depth sections of 12-in. depth and flange width of 14 in.; sections 12 in. deep with 6½-in. flange, 14 in. deep with 6¾-in. and with 15-in. flange, sections 18 in. deep and 7½-in. flange and 24-in. sections, with 9¾-in. flange. Besides these 10 sections, a group of 13 others, including the three remaining sections of constant depth, are scheduled for preparation next. Remaining sections in a third group will, it is stated, be ready, with a few exceptions, by the middle of June.

"Budgeting Technique" and "Charts and Manuals in Organization Work" are two booklets issued recently by the American Management Association, 20 Vesey Street, New York. The first, designated as annual convention series No. 51, is a symposium prepared by J. O. McKinsey and a committee, and the second, No. 50, is made up of addresses and discussions delivered at the association's autumn convention.

Automobile production is now increasing at the plants of most of the companies and indications are, according to *Automotive Industries*, that February will be a very satisfactory month, though not an unusually high one for the industry. For companies exclusive of Ford, January production was approximately 57 per cent over December and 5 per cent under January, 1926.

Oil shale can be profitably produced by labor saving machines, such as are used in open pit mining, says Louis Simpson, consulting engineer, Ottawa, Can. The cost of mining shale, he asserts, will be low. The mining can be conducted by Diesel oil engine driven shovels or electrically operated slicing excavators.

New England Foundrymen Hear Alloy Cast Iron Discussed

The chief speaker at the February meeting of the New England Foundrymen's Association at the Exchange Club, Boston, Feb. 9, was D. M. Houston, International Nickel Co., New York. He discussed the value of alloys in cast iron and gave the substance of three papers previously prepared by him.

To a large extent his remarks concerned the introduction of nickel to cupola mixtures and the influence of nickel on the silicon and combined carbon content, together with rigidity, machinability, etc. Tables were given showing the introduction of steel scrap with nickel to a foundry scrap and pig iron mixture, and again, in contrast, the elimination of steel scrap and substitution of nickel with foundry scrap and pig iron. On the one hand the nickel produces a hard and on the other a soft casting, but in both instances the Brinell hardness and machinability are materially raised. Savings in machine shop time ranged from 15 to 20 per cent. Mr. Houston said that foundrymen often maintain they can control the silicon content in cupola practice within a range of 10 points. He knows of but one foundry that can do so without the introduction of nickel.

Charles F. Miller, Universal Winding Co., Providence, R. I., vice-president of the association, outlined future activities. If present plans carry the March meeting will take the form of a discussion on a casting, blueprints of which are now in the hands of association members. J. D. Towne, Dayton Steel Casting Co., Dayton, Ohio, will talk on the handling of cleaning room problems at the April meeting. R. F. Harrington, Hunt-Spiller Corporation, South Boston, will discuss problems involved in clay binding in molds at the May meeting, while the June meeting will be given over to core sands and core room problems. The Shepard Electric Crane & Hoist Co. and the New York Sand & Facing Co. were elected members of the association.

Reinforcing Institute to Meet at White Sulphur Springs

The Concrete Reinforcing Steel Institute will hold its third annual meeting at the Greenbrier, White Sulphur Springs, W. Va., March 21 to 23. The opening session will be held Monday evening, March 21, when the principal address will be by Charles F. Abbott, executive director American Institute of Steel Construction, whose topic will be "Mill Competition and Desk Brokers." On March 22 the speakers will be H. J. Burt, consulting engineer, Chicago, whose subject will be "Who Is Responsible?" and Capt. John W. Gorby, Chicago, whose topic will be "New Wave Lengths in Business Broadcasting." A golf tournament will be held on March 23.

Aluminum Bronze Manufacturers Form Institute

Manufacturers of alloys interested in aluminum bronze castings and rolled products have formed an organization for purposes of research which will be known as the Aluminum Bronze Manufacturers' Institute. A central office, or headquarters, has been opened in Washington.

The member companies of the institute are: American Metal Products Co., Milwaukee; Buffalo Bronze Die Cast Corporation, Buffalo; Duriron Co., Dayton, Ohio; Hills-McCanna Co., Chicago; The Michigan Smelting & Refining Co., Detroit.

The director of the institute is W. M. Corse, metallurgical engineer, Washington, who has been connected with the aluminum bronze industry in this country since its inception.

Through co-operative advertising, research and development the institute plans to establish the reputation and increase the use of aluminum bronze as a reliable, first-quality engineering material resembling steel in many of its physical properties and used so largely in worm wheels and bearings. The central office will serve as a clearing house for distributing information on the uses and properties of this alloy.

Steel Club of Philadelphia Holds Its Annual Dinner

The Steel Club of Philadelphia, a social organization of district sales managers and salesmen, held its eighth annual dinner Friday evening, Feb. 11, at the Manufacturers' Club, Philadelphia. Frank W. Jones, Eastern Steel Co., president of the Steel Club, was master of ceremonies. Following the dinner there was a vaudeville entertainment. Steel men from Pittsburgh, New York and other centers were present and the guests included many purchasing agents in the Philadelphia territory.

To Discuss Billet Steel for Reinforcing Bars

WASHINGTON, Feb. 15.—Invitations will be sent out on Saturday of the present week by the National Committee on Metals Utilization, Department of Commerce, for a conference beginning at 10 a. m., March 19 in rooms G and H, United States Chamber of Commerce building here, to receive a report from a committee regarding the establishing of one grade of new billet steel for concrete reinforcing. The committee will make a recommendation which will be submitted to a later conference for final action. The forthcoming committee report was authorized at a conference held Jan. 26, 1926.

New York Steel Treaters to Hear Dr. Desch

At the February meeting of the New York chapter of the American Society for Steel Treating, Friday, Feb. 18, in the Woolworth Building, Dr. Cecil H. Desch, the eminent British metallurgist, will be the principal speaker. This meeting is postponed from the usual date, Feb. 14.

To Discuss Trade Relations in Havana

Cuban-American trade relations will be discussed at the meeting of the board of directors of the Chamber of Commerce of the United States to be held at Havana, Cuba, on Feb. 17 and 18. Among those who will attend the meeting are: Max W. Babb, vice-president Allis-Chalmers Mfg. Co., Milwaukee; William Black, president B. F. Avery & Sons, Inc., Louisville; A. J. Brousseau, president Mack Trucks, Inc., 25 Broadway, New York; Stanley H. Bullard, vice-president, Bullard Machine-Tool Works, Bridgeport, Conn.; Frederick J. Haynes, chairman of board Dodge Brothers, Inc., Detroit; Harry D. Sharpe, president Brown & Sharpe Mfg. Co., Providence, R. I.

Becomes Member of Federal Trade Commission

WASHINGTON, Feb. 15.—Confirmed last week by the Senate, Edgar Allen McCulloch, Democrat, former chief justice of the Supreme Court of Arkansas, has taken up his duties as a member of the Federal Trade Commission.

Among the Harvard advertising awards founded by Edward W. Bok, a prize of $2,000 and certificate, awarded for the first time, for the best industrial advertising campaign seeking publicity through the mediums of industrial, trade, or professional journals, went to the Rome Wire Co., Rome, N. Y., and Moser & Cotins, Utica, N. Y., for the advertising of the Rome Wire Co. products.

LARGER ORE SHIPMENTS

Movement in 1926 from Lake Superior Ranges Shows 8 Per Cent Increase Over 1925

LAKE SUPERIOR iron ore shipments in 1926 totaled 59,984,249 gross tons, as compiled by *Iron Trade Review*. Of this amount, 58,537,855 tons was shipped by steamer and 1,446,394 tons by rail. Both methods of shipment show an increase, that by lake having been 8.2 per cent, while that by rail was only 0.7 per cent. Shipments by ore boats and by rail for the five most recent years are shown in Table I.

Shipments of the Oliver Iron Mining Co., a subsidiary of the United States Steel Corporation, amounted in 1926 to 26,053,258 tons, or 43.43 per cent of the total. This proportion was substantially the same as in 1926, when Oliver shipments aggregated 24,688,690 tons. The total Oliver shipments from the beginning of 1909 have been 413,074,050 tons. Total shipments from all ranges from their several beginnings are reported at 1,293,921,639 tons.

Eight leading operators accounted for 89 per cent of all the ore sent out of the Lake Superior district in 1926. Fourteen other companies had individually less than 1.5 per cent of the total.

Ore beneficiated showed a heavy gain. It amounted in 1926 to 21,437,031 tons, an increase of 34.7 per cent over the 15,917,031 tons beneficiated in 1925. The increase was almost entirely in ore crushed and screened, the amount of which was 15,655,662 tons. Washed ore aggregated 5,297,498 tons; dried, 245,311 tons; sintered, nodulized and briquetted, 138,061 tons; jigged, 100,499 tons.

All the large ranges increased their shipments in 1926. From the Mesabi range, the total was 38,249,793 tons, a gain of 6.5 per cent; the Marquette shipped 4,442,765 tons, a gain of 6.1 per cent. The Menominee shipped 5,945,811 tons, a gain of 12.8 per cent; the Gogebic range shipped 7,536,389 tons, a gain of 6.6 per cent; the Cuyuna range shipped 2,091,487 tons, a gain of 38.6 per cent; the Vermillion range shipped 1,586,054 tons, a gain of 10.3 per cent. There was a loss in shipments from the Mayville-Baraboo range, which amounted to 131,950 tons, a drop of 15.9 per cent.

High costs of production, including heavy taxes, coupled with low unit prices for ore, have compelled certain mines to close. At the same time, they are forcing the utmost production from the best properties. Last year only 79 mines were active on the Mesabi range, against 87 mines in 1925. The average output per mine increased heavily, partly because of the greater total production. It was 479,111 tons in 1926, against 412,528 tons in 1925 and only 228,361 tons in 1914.

Active mines in other districts decreased somewhat, leaving a total of 174 in 1926, against 186 in 1925. The average shipment from all mines in 1926 was 344,737 tons, compared with 298,475 tons in 1925. Mines active included the following: Mesabi range, 79; Menominee, 32; Marquette, 22; Gogebic, 20; Cuyuna, 15; Vermillion, 5; and Mayville-Baraboo, 1.

While the 1926 total was the largest since the 60,780,003 tons of 1923, it was surpassed by four earlier years, 1920 having shown 60,411,572 tons; 1918, a total of 62,836,172 tons; 1917, an aggregate of 64,437,903 tons and 1916, the highest of all, at 66,658,466 tons.

Manganiferous Iron Ore in the Open-Hearth

The use of manganiferous iron ore in open-hearth furnaces is discussed in an attractively prepared 12-page, illustrated, 11 x 8½ in. booklet issued by Oglebay, Norton & Co., Cleveland iron ore merchants. The title is "Why Charge Manganiferous Iron Ore in the Open-hearth?"

The booklet includes information about "Manganate charge ore," a manganiferous iron ore from the Bristol mine, Crystal Falls, Mich., which is marketed by the Oglebay, Norton & Co. A number of steel makers have made exhaustive trials of this ore as an open-hearth charge, with favorable results, it is stated. These reports as summarized indicate a decrease in the cost of steel making through a saving of ferromanganese, fluorspar and limestone, a decrease in the action of the flush-off slag on the furnace lining as compared with finer ores and the production of a steel of better quality. It is also stated that, with the use of this ore, it is possible to charge a high percentage of hot metal without causing a violent boil or blow. An analysis is given of the flush-off slag and of the slag test at tapping as made by a producer based on 212 heats. The residual manganese in the steel showed an average of 0.16 per cent compared with former practice of 0.11 per cent. There was no increase in sulphur and there was a saving of about $5 per heat in ferromanganese and fluorspar.

The booklet also contains an analysis and sieve test of "manganate charge ore," which when dried has a content of 4.14 per cent manganese. Extracts from a paper covering the use of high manganese basic pig iron and manganiferous ores in open-hearth steel practice, presented at the last October meeting of the American Iron and Steel Institute, are also included.

The M. A. Hanna Co., Cleveland, reports net income of $1,547,000 for the year ended Dec. 31, 1926, after all charges, including $1,419,000 for depreciation and depletion, but without provision for dividends. This compares with earnings of $123,000 in 1925 and a deficit of $1,651,000, in 1924. The company's working capital at the end of 1926 was $11,674,000 as compared with $10,291,000 at the end of 1925. Profit and loss surplus was $2,907,837.

Table I.—Shipments by Ports and All-Rail

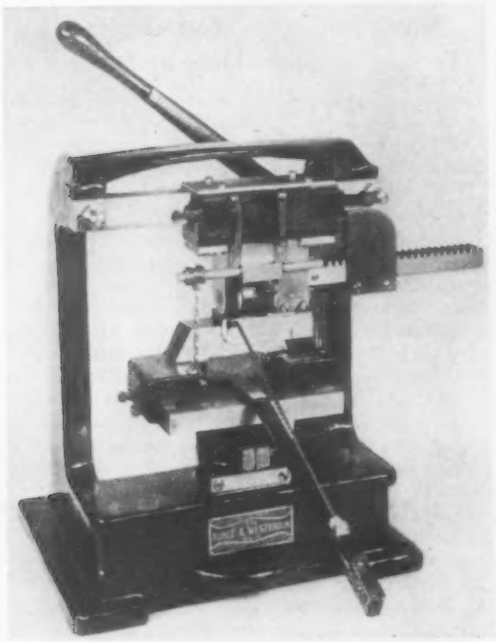
	1926	1925	1924	1923	1922
Escanaba	6,599,597	5,644,278	4,244,669	5,607,411	4,592,354
Marquette	3,417,462	3,487,968	2,516,548	2,789,285	1,976,220
Ashland	7,139,865	6,664,501	4,807,565	6,237,449	5,813,207
Two Harbors	6,266,272	6,016,096	4,817,494	6,418,464	5,952,437
Superior	16,476,264	14,560,477	13,355,214	17,820,476	11,234,240
Duluth	18,638,395	17,707,978	12,882,082	20,163,619	13,044,771
Total by lake	58,537,855	54,081,298	42,623,572	59,036,704	42,613,229
Total by rail	1,446,394	1,435,046	1,271,538	1,743,299	1,376,867
Total	59,984,249	55,516,344	43,895,110	60,780,003	43,990,096

Table II.—Iron Ore Shipments by Ranges

	1926	1925	1924	1923	1922
Mesabi	38,249,793	35,889,988	29,141,665	41,814,463	28,055,394
Marquette	4,442,765	4,185,533	3,174,660	3,892,666	2,817,390
Menominee	5,945,811	5,268,846	3,826,707	4,854,781	4,078,519
Gogebic	7,536,389	7,068,296	5,159,828	6,579,950	6,218,610
Vermillion	1,586,054	1,437,577	978,097	1,278,598	1,211,467
Cuyuna	2,091,487	1,509,217	1,468,940	2,220,745	1,497,615
Mayville-Baraboo	131,950	156,887	135,203	138,800	110,101
Total	59,984,249	55,516,344	43,895,110	60,780,003	43,990,096

Automatic Numbering and Knurling Machine

The marking of serial numbers, dates and other identification marks, and the knurling of a border on small rings is the function of the machine illustrated, which is being marketed by the Noble & Westbrook Mfg. Co., Hartford, Conn. The machine is for the most part the same as the company's standard units, previously offered, but is fitted with a special automatic numbering head designed to mark the parts as they are placed on the mandrel of the machine.



Small Rings Are Marked with Serial Numbers, Dates, Etc., and the Border Is Knurled

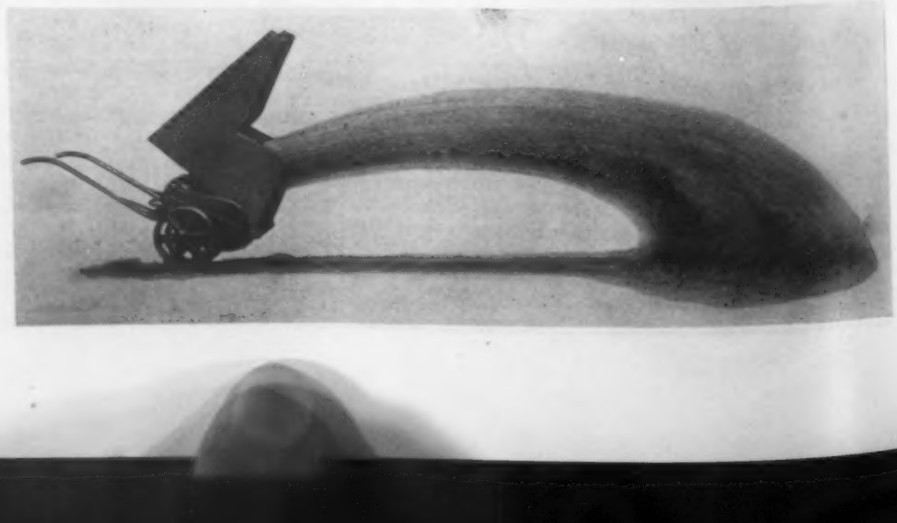
The special numbering head is arranged so that it will put a serial number on the periphery of the ring, also the identification marks and the date. This marking is followed by knurling of the edge of the rings. As this operation is completed, the ring is automatically ejected from the supporting pin on to a needle which keeps these in order so that they can be strung on string or wire in serial order. The operator is merely required to place the rings on the mandrel and pull the lever handle. The weight of the machine, including the numbering head, is 75 lb.

Sand-Conditioning Equipment for the Small Foundries

A portable sand-conditioning machine for use in small foundries and for special jobs and confined spaces in large foundries is being marketed by the Production Equipment Co., 5213 Windsor Avenue, Cleveland.

The machine, designated as the model H conditioner, is designed to be handled and operated by one man. It is made up of a motor-driven cutting cylinder, housing and sheet metal hopper, the entire unit being mounted on a structural steel frame. The housing is split horizontally so that the entire top may be removed conveniently for inspection of the working parts. The sand is shoveled into the hopper, which directs it on to the rapidly revolving cylinder. The cylinder, in turn, separates, blends and aerates the sand, and throws it in a finely-divided stream into a heap or on to a riddle. The cylinder whips the sand both radially and laterally, thus assuring, it is claimed, thorough reconditioning of the sand before it is sprayed from the hopper. The drive from the motor is by means of silent chain, the entire drive being inclosed to prevent damage from the action of the sand.

An inclined screen or a power-driven riddle can be supplied for use when it is desired to riddle the sand before reuse. These may be furnished either as a separate attachment, attachable to and removable from the sand-conditioner, or for permanent connection to the machine.



The Revolving Cylinder, Motor Driven, Blends and Aerates the Sand and Throws It Into a Heap or on a Riddle

Another Gain in Employment in Metal Trades

Employment in metal-working shops affiliated with the National Metal Trades Association, Chicago, showed a gain for the second consecutive month in January. The number employed in these plants in January was 598,653, or 13,159 more than the total for December. The gain in January was concentrated in the States of Michigan, Indiana and Ohio. Detroit alone showed an increase of 10,837. On the other hand, other districts, embracing New England, New York, New Jersey, Pennsylvania and Maryland, and Illinois, Wisconsin, Iowa and Missouri, reported losses.

New Radiation Pyrometer

A new radiation pyrometer has been developed by the Pyrometer Instrument Co., 74 Reade Street, New York. It is known as the "Pyro" instrument and employs the principles of radiant heat. Thus it is used at a distance from the furnace. The illustration shows its general appearance. The overall dimensions are 7 in. long by 4⅝ in. diameter, and the weight is 25 oz.

The Pyrometer Is Used at a Distance From the Furnace

The operator is not required to perform any measurements or comparisons, so that the readings are independent of personal error. Temperature readings are automatic, the instrument being pointed at the hot body to be measured and the instrument being handled with the facility of a field glass.

Blanchard Vertical Surface Grinder with Improved Base

Larger water capacity and longer bearing on the floor are recent improvements in the No. 16 vertical surface grinder of the Blanchard Machine Co., Cambridge, Mass. The overall length of the machine is increased only 2 in.

The coolant capacity of the new base is in excess of 100 gal., as compared to 65 gal. in the previous machine, an illustrated description of which appeared in THE IRON AGE of June 17, 1926. The additional capacity provided helps to keep the work and machine cooler on heavy grinding. The treadle shaft is neatly housed in the end of the base, and the opposite end of the base, under the column, is carried straight down to the floor instead of being undercut. These changes of outline improve the appearance and distribute the weight over a larger floor area, without appreciably increasing the space occupied. The motor connections, formerly in a box on back of the base, are now inside the column, but easily accessible.

Angle Iron Bender and Notcher

An angle iron bender and an angle iron miter notcher with capacity for bending and notching 3 x 3 x ⅜ in., or smaller angle iron has been added to the line

The Bender Is at the Left and the Notcher at the Right. The capacity is for angle iron up to 3 x 3 x ⅜ in.

of the Whitney Metal Tool Co., Rockford, Ill. Each of these machines is furnished complete with a stand, as shown in the illustration, and an operating hand wheel is provided to facilitate production.

The bender is designated as the No. 61. It not only bends angle iron, but with special jaws provided, it may be used for bending pipe, flats, rounds and T-iron. The miter notching unit is designated as the No. 60. Another tool added recently to the company's line is a No. 16 bench punch which has capacity for punching of ⅝ in. holes through ¼ in. material.

"Oil for 1000 Years" is the title of a booklet recently issued by the American Nokol Co., 215 North Michigan Avenue, Chicago. It essays to show that the potential oil supply of the United States from all sources is practically unlimited. Various authorities are quoted, and information is provided to show that liquid fuel from shale fields, coal tar and industrial alcohol produced by annual crops will be sufficient to care for vastly increased consumption.

Dings Company Wins Title to Magnetic Pulley Patent

A mandatory injunction decreed by the United States District Court of the Eastern District of Wisconsin in favor of the Dings Magnetic Separator Co., Milwaukee, was affirmed by the United States Court of Appeals on Jan. 18, without modification. The injunction restrains a competitor from building ventilated magnetic pulleys which infringe patent No. 1,369,516 and is the result of an action brought by the Dings company against a manufacturer of magnetic pulleys.

The magnetic pulley is used in the separation of stray iron in grinding and crushing plants and in many lines of manufacture, such as feed mills, foundries, potteries, chemical plants, etc. The ventilated magnetic pulley design provides surfaces within the pulley for the radiation of heat generated in the magnet coils and permits air to circulate through the pulley, thus to dissipate the heat.

Cost of Standardization

WASHINGTON, Feb. 14.—Replies to a questionnaire of the Committee on Standardization show that more than $7,250,000 is expended annually for standardization. These replies are from about one-half of the 400 trade associations and technical societies to which the questionnaire was sent. The committee, of which Secretary of Commerce Herbert Hoover is chairman, and W. Chattin Wetherill is secretary, includes some of the most prominent industrial leaders and engineers of the country. Among other members are Chairman Charles M. Schwab of the Bethlehem Steel Corporation and President James A. Farrell of the United States Steel Corporation.

The survey of national standardization has been taken up with the committee in cooperation with the American Engineering Council, and information gathered from work already done at the Bureau of Standards left only the amount of expenditures for standardization to be obtained. The purpose of the report, which probably will be submitted in the near future, is to make a complete statement of the current status of standardization in the United States. After the report is made there probably will be a general conference to consider it, and to adopt whatever action will, in the opinion of the conference, stimulate and expedite coordination of all standardization activities.

Acquires Heine Boiler Co.

The International Combustion Engineering Corporation, 43 Broad Street, New York, has purchased the capital stock of the Heine Boiler Co., St. Louis, and will immediately take over the operation of the latter company's boiler shops at St. Louis and Phoenixville, Pa. All types of water-tube boilers will be manufactured at St. Louis, and the acquisition will enable the parent company to supply complete steam generating units fired with pulverized fuel or mechanical stokers, all of its own manufacture. C. R. D. Meier will continue as president of the Heine company.

Austin Co. to Place Large Orders for Steel and Other Materials

The Austin Co., Cleveland, specialist in industrial buildings, informs THE IRON AGE that within the next two weeks it will place orders for large quantities of building materials, including 15,000 tons of steel shapes, plates and bars, 20,000 tons of fabricated structural steel, 50,000 sq. ft. of steel rolling doors, 2,000,000 sq. ft. of steel sash, 3000 tons of metal roofing and siding, 12,000 tons of reinforcing steel, 100,000 lineal ft. of mechanical sash operating devices, 1000 tons of rivets, 50,000 sq. ft. of fire doors, 500,000 sq. ft. of wire mesh for floors. Considerable new machinery is also on the company's list of 1927 requirements. The company carries large stocks at Cleveland, Philadelphia and Chicago.

Steel Cartel Reduces Tonnage Quota

French Output Less Than Allotted—British Semi-Finished Imports Heavy —South Africa Considers Subsidizing Steel Industry

(*By Cable*)

LONDON, ENGLAND, Feb. 14.

PROMPT pig iron is still scarce and consumers are showing increasing interest in forward business. Sales, however, are unimportant, the position of makers hinging on fuel costs which are still about 7s. per ton more than the pre-strike market.

More furnaces have been blown in, so that 26 are now in blast in Scotland. The hematite shortage is acute and consumers are buying continental iron. Meanwhile export demand is good although sales are limited because of small output. Foreign ore is quiet.

Finished steel is dull, with consumers awaiting lower prices and makers generally well booked on old contracts and making good shipments.

Tin plate is easy as a result of the decline in cost of foreign steel. Welsh tin plate makers are able to buy continental tin plate bars at £5 ($24.25) per ton, delivered. Tin plate business is small as consumers are awaiting signs of greater stability of prices. Galvanized sheets are moderately active on small orders. Black sheets continue quiet and Japanese demand for thin gages is at a low ebb. Heavier gages of black sheets are easier with foreign competition keen.

January exports of pig iron totaled 2429 tons, none of which was shipped to the United States. Total export of iron and steel was 219,369 tons. Imports are increasing and the total for January was 555,453 tons, of which more than 90,000 tons was pig iron, 110,000 tons was billets and other semi-finished steel and 93,000 tons was sheet and tin plate bars.

Continental markets are steadier as a result of the belief that the market has reached bottom, but consumers generally are still cautious in buying. The International Raw Steel Cartel has reduced the quota for second quarter to 25,287,000 tons. On this basis, the new German quota will be 10,227,000 tons but it is anticipated that this will be increased.

The South African government is considering a proposal to subsidize the steel industry. The bill discussed calls for the formation of a company with capital stock of £3,000,000 and £500,000 of debenture bonds, the latter to be held by the State. This would provide, in part, for the erection of works at Pretoria.

FRENCH OUTPUT WITHIN QUOTA

Domestic and Export Demand Small and Prices Soft—Stable Currency Not Increasing Business

PARIS, FRANCE, Jan. 28.—Although a stable currency seems assured, with the franc at 122 to 123 to the pound sterling, there is still no revival of demand and but little increase seems to be expected until well into the spring. Confidence in the currency seems to have returned, but prices are apparently at the lowest possible level, unless there is a downward revision of the cost of production by lowering wages, fuel prices, freight rates or business taxes. A small reduction in the price of fuel was announced for early February, but it is not expected to exercise much effect on the cost of the finished product. Export business is small and prices continue their downward trend under the keen competition between cartel members and non-member producing countries.

Pig Iron.—Output in December totaled 827,000 metric tons, about 38,000 tons more than in November, but in view of the smallness of demand in recent weeks January may show a decline, although only a few furnaces have been reported out. Establishment of prices and selling conditions for phosphoric foundry iron in February have been delayed until the amount of the price reduction on coke is known. It is, however, believed that the base price will be reduced to 500 fr. ($19.65) per ton for No. 3 P. L. Hematite producers are maintaining prices for February, but are authorized to quote competitively when necessary. Tonnages of foundry iron established for the domestic trade include 30,000 tons for February and tentatively 10,000 tons

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, f.o.b.	£1	5s.				$6.06	
Bilbao Rubio ore†	1	2	to £1	2½s.		5.33 to	$5.45
Cleveland No. 1 fdy. (nom.)	4	5				20.61*	
Cleveland No. 3 fdy.	4	2½				20.00*	
Cleveland No. 4 fdy.	4	1½				19.76*	
Cleveland No. 4 forge	4	1				19.64*	
Cleveland basic (nom.)	3	15	to 3	15½		18.18 to	18.30
East Coast mixed	4	10	to 4	11		21.82 to	22.06
East Coast hematite	4	8	to 4	12½		21.34 to	22.43
Rails, 60 lb. and up	7	15	to 8	0		37.58 to	38.80
Billets	7	5	to 7	10		35.16 to	36.37
Ferromanganese	16	0				77.60	
Ferromanganese (export)	15	15				76.38	
Sheet and tin plate bars, Welsh	6	5	to 6	15		30.31 to	32.73
Tin plate, base box	0	19¾	to 1	0¼		4.78 to	4.91
Black sheets, Japanese specifications	15	0	to 15	10		72.75 to	75.17
						C. per Lb.	
Ship plates	8	10				1.84	
Boiler plates	10	15	to 11	5		2.32 to	2.43
Tees	8	15	to 9	5		1.89 to	2.00
Channels	8	0	to 8	10		1.73 to	1.84
Beams	7	15	to 8	5		1.67 to	1.78
Round bars, ¾ to 3 in.	8	5	to 8	15		1.78 to	1.89
Steel hoops	10	10	and 11	0		2.28 and	2.39
Black sheets, 24 gage	11	5	to 11	10		2.43 to	2.49
Galv. sheets, 24 gage	15	5	to 15	10		3.30 to	3.35
Cold rolled steel strip, 20 gage, nom.	18	0				3.91	

*Export price, 6d. (12c.) per ton higher.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)					
Belgium	£3 13s.	to £3 18s.		$17.70 to	$18.90
France	3 13	to 3 18		17.70 to	18.90
Luxemburg	3 13	to 3 18		17.70 to	18.90
Basic pig iron:					
Belgium	3 8			16.49	
France	3 8			16.49	
Luxemburg	3 8			16.49	
Coke	0 18			4.37	
Billets:					
Belgium	4 7½			21.22	
France	4 7½			21.22	
Merchant bars:				C. per Lb.	
Belgium	4 17½			1.07	
Luxemburg	4 17½			1.07	
France	4 17½			1.07	
Joists (beams):					
Belgium	4 18½			1.08	
Luxemburg	4 18½			1.08	
France	4 18½			1.08	
Angles:					
Belgium	5 0			1.10	
⅛-in. plates:					
Belgium (nominal)	6 10			1.42	
Germany (nominal)	6 10			1.42	
¾-in. ship plates:					
Belgium	6 0			1.31	
Luxemburg	6 0			1.31	
Sheets, heavy:					
Belgium	6 3	to 6 4		1.33 to	1.34
Germany	6 3	to 6 4		1.33 to	1.34

(a) Nominal.

each for March and April. The desirability of reducing prices for export is being discussed and the Belgian price has been decreased. The ferroalloys market is quiet and sellers are granting concessions from the base prices on orders of 10 tons or more.

Semi-Finished Material.—Prices of billets and blooms are firmer, largely as a result of resumption of purchasing by British consumers. This has given rise to some optimism, as without the return of Great Britain to the market, prices would doubtless have declined further. Lorraine mills are quoting open-hearth steel billets at 670 to 700 fr. per ton ($26.33 to $27.50) to domestic consumers, which would establish basic steel billets at about 580 fr. per ton ($22.78). Export prices, however, are weak with billets at £4 10s. to £4 14s. per ton ($21.82 to $22.78) and blooms at £4 4s. to £4 10s. per ton ($20.37 to $21.82), all f.o.b. Antwerp.

Finished Material.—The December ingot production was 741,000 tons, surpassing by 27,000 tons the November output. Production is still smaller than the quota permitted in the International Raw Steel Cartel, but French mills point out that it amply supplies both domestic and export requirements at present. In recent weeks there has been a slight improvement in demand that may permit an increased output of steel, closer to the official quota in the cartel. Prices of beams are weak but the bottom has apparently been reached, at least for the present, as in making any further reductions, mills are faced with continued high costs. For export, quotations range from £4 19s. to £5 2s. per ton for beams (1.09c. to 1.12c. per lb.), and £4 19s. 6d. to £5 per ton for bars (1.09c. to 1.10c. per lb.), f.o.b. Antwerp. Demand for sheets continues small and prices are generally unchanged.

FRENCH COMPETE IN BELGIUM

Cancellations with Rise in Franc Force France to Widen Markets—Prices Declining

ANTWERP, BELGIUM, Jan. 29.—Demand, instead of showing increases, is declining and prices are developing further weakness, particularly for export, where French competition is strong. With low prices, French mills have even entered the Belgian domestic market seeking sufficient backlog to maintain operation, having lost considerable tonnage that was booked at the time when the franc was low in value, but canceled since stabilization of the currency. As a result of this lack of business and the activity of French competitors, prices are unsteady, differing with each order, so that it is exceedingly difficult to determine the ruling price on any product. With buyers withholding purchases, however, the trend of the market is definitely downward. In some quarters, it is claimed that prices have reached bottom and with the expected increase in buying as spring approaches, there may be a slight upward movement that will result in stabilization at about the present level.

Pig Iron.—Demand is at a low level and the price for domestically consumed foundry iron has been dropped to 140 fr. (Belgian) ($19.46). The export price has been established at £3 12s. 6d. to £3 18s. per ton ($17.57 to $18.90), f.o.b. Antwerp. Coke prices are expected to be reduced early in February, with a considerably better supply available.

Semi-Finished Material.—Practically no business is being done in billets, blooms or slabs. Prices are weakening under competition of French sellers, who are apparently willing to make almost any concession demanded by the purchaser. Nominally, billets are £4 10s. ($21.82) for 3-in. to 4-in., with 2-in. to 2½-in. billets at £4 14s. per ton ($22.78). Blooms are not quite so soft and are holding at £4 15s. per ton ($23.03) for 6-in. and £4 10s. ($21.82) for 4-in. material.

Finished Material.—With French competition strong, the market is rather demoralized. A few mills, obviously in need of tonnage to maintain operations, are occasionally meeting concessions demanded, but others in a better position are holding out for their originally quoted prices and consequently taking no orders. Domestic consumers and exporters are, as far as possible, abstaining from purchasing in expectation of lower prices. Bars are quoted at £5 3s. per ton (1.13c. per lb.), f.o.b. Antwerp, but as low as £5 per ton (1.10c. per lb.) has been done by Belgian mills and French sellers are reported to have taken orders at £4 19s. per ton (1.09c. per lb.). Beams range from £5 to £5 2s. per ton, (1.10c. to 1.12c. per lb.) with a few sellers offering to take export business at £4 19s. (1.09c. per lb.), where orders call only for normal specifications. Corrugated bars have been reduced to £5 10s. to £5 12s. per ton (1.21c. to 1.23c. per lb.). Steel hoops are on a basis of £6 7s. 6d. to £6 10s. per ton (1.40c. to 1.42c. per lb.) Sheet prices are weak with light gage Thomas steel sheets at £7 5s. per ton ($35.16) for 1/16-in.

MORE EUROPEAN MERGERS

Cartels and Corporations in Poland, Rumania, Jugoslavia, Czechoslovakia—Rails Advance

HAMBURG, GERMANY, Jan. 27.—The smaller European steel producing countries are evidently following the example of German industry, in merging their steel mills into single units. One of the leading eastern European countries which has recently been active in such amalgamations is Poland, where a close cartel has been formed, eliminating competition between the former German works and the old Russian steel mills by fixing common selling prices. The Polish wire and wire nail manufacturers have just formed an association regulating both output and prices.

Consolidations and cartels have appeared in Rumania also, where the old Rumanian steel works have entered into a cartel with the former Hungarian works in Siebenburgen. This cartel also regulates prices and output in a manner similar to the German Raw Steel Cartel. In Jugoslavia the steel producers have entered into an association to which the hardware manufacturers have decided to adhere. The Czechoslovakian wire cartel has been renewed for seven years and mergers of the principal steel works are expected soon.

The Austrian and German wire associations have entered into an agreement not to compete against each other and foreign markets have been divided between the two associations on the basis of 1926 exports.

Prices of rails have been increased by the European Rail Makers' Association. Although the official price is still £6 per gross ton ($29.10), f.o.b., the Finnish Government recently paid £6 11s. 6d. per ton ($31.88) for 20,000 tons of rails, and 8000 tons of rails for Norway went at the same price. The order from Finland was placed with Belgian and French mills and the Norwegian contract went to Germany. German mills also booked, through the rail association, 7000 tons for Russia, 12,000 tons for Italy, 5000 tons for Switzerland, 4000 tons for South Africa and 22,000 tons for Rumania. Further orders of 40,000 tons for Rumania and 15,000 tons for Jugoslavia are expected.

Indian Pig Iron Exports

That the Indian outflow of pig iron has been setting more heavily toward Japan than toward the United States is indicated in figures published in the January issue of *Stahl und Eisen*. These cover the fiscal years 1924-1925 and 1925-1926 and show the following movement:

Destinations	1925-26	1924-25
Japan	170,879	174,412
United States	158,561	135,901
Great Britain	20,501	19,328
Germany	11,468	1,646
China and Hongkong	11,294	2,951
Australia and New Zealand	3,720	4,255
Other Countries	11,568	8,294
Total	388,101	346,787

Total production of pig iron in India increased slightly from 886,508 tons in 1924-1925 to 894,156 tons in the following year. The percentage of output exported advanced from 39 to 43.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Statistical Data Concerning the Chief Consuming Industries Indicate That:

1. Steel ingot production has turned up, in conformity with the much higher position of composite steel demand.

2. Trend in chief consuming industries appears to be rounding off for a decline.

3. Car orders were better in January than for any recent January, but locomotive orders dropped to the lowest January in five years.

4. Structural steel sales are supported irregularly by public works and other spasmodic improvements.

5. Sales of finished steel in fourth quarter were the lowest since 1923; December was lower than any other December in several years.

6. Automobile production is nearly down to the low point of 1924, and a saturation point appears.

7. General manufacturing activity, outside steel and automotive industries, continues in large volume.

8. Oil production and mining activity have been well sustained; the oil fields and freight cars brought good demand for plates.

9. Farm purchasing power has been downward; farm machinery demand is likely to be light, except for export.

IN some respects, the situation in the steel industry continues to resemble conditions in 1923. The composite demand line (shown in the first chart) lies above the curve of ingot production. The production of steel ingots, after several months of sharp decline, turned upward in January, much as in January, 1924. There has thus been a readjustment in production that has brought it well within the indicated potential demand.

But there are also important differences. In the first place, the trend of activity in the chief consuming industries does not show the upward slant that existed in the latter part of 1923—in fact, it appears to be rounding off for a decline. In the second place, the production of steel ingots was not curtailed so much in 1926 as it was in 1923, nor has it shown so much recovery this January as in January, 1924.

Moderate Decline in Activity Probable

It seems to be the logical conclusion that (aside from the merely seasonal movements) there will be some further decline in the activity of the steel industry, but that it will not be severe. We look for no collapse such as occurred late in 1920, nor even anything resembling the decline in the middle of 1924. At least, this does not seem probable so long as the present level of activity in the chief consuming industries is maintained. Even if buyers refuse to make future commitments, they must continue to buy steel from day to day as long as they operate at anything approximating the present high rate. Nevertheless, the situation appears to suggest nothing more than a little seasonal gain in the near future. The general trend probably will be downward during the first half of the year.

The chief factors tending to sustain the composite demand line in December are as follows: *Railroad freight traffic*, allowing for the usual seasonal changes, made the highest of any monthly total of the year; this condition found expression in a revival of orders for freight cars, as well as in other directions. But the increase in freight traffic was chiefly due to an unusually heavy movement of coal, and it will be noted that the December statements of most of the roads, other than the coal carriers, were unfavorable, in comparison with a year ago. This was due in part to increased wage payments and in part to the limits of

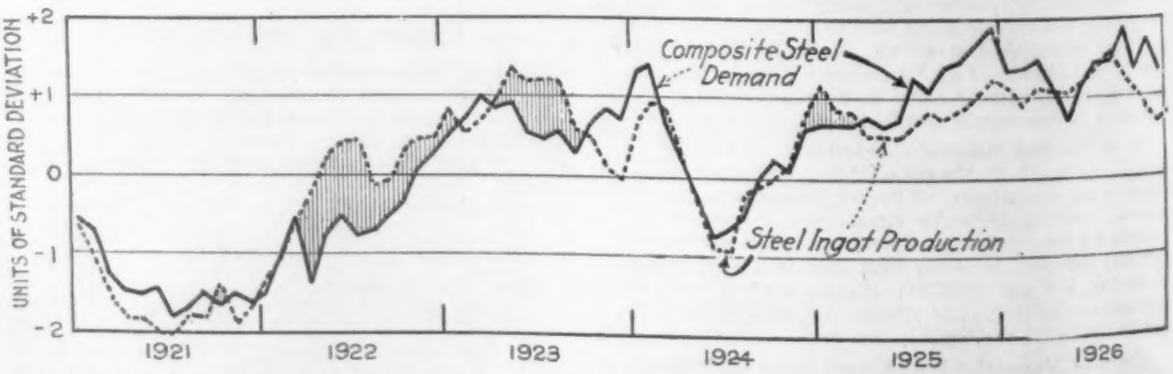


Fig. 1—Steel Ingot Production, Adjusted for Seasonal Variations, Turned Upward in January for the First Time Since August. This was foreshadowed last month—"as it appears to be well below demand, further declines are not to be expected." Demand dropped in December to below the October level, and the lowest since June

In This Issue

Is the reputation of your product dependent upon the skill of a few practical heat-treaters?—Remarkable results are oftentimes obtained by practical men, without technical knowledge, working with primitive equipment. But the manufacturer who neglects to provide against the possible loss of those men is courting trouble.—Page 488.

Foresees a steadily increasing substitution of aluminum for cast iron.—Development is chiefly retarded by the insufficient output of aluminum, French foundryman says.—Page 499.

No longer do the prices of various steel products fluctuate in line.—In the old days of forward buying a decline in one product was almost certain to be reflected in the others. Now each moves independently of the others and makes its own prices in open-market trading.—Page 520.

Large plants have relatively fewer accidents than small establishments.—The latter usually have not the means to pay for "safety" improvement, nor is safety work given the same attention it commands where labor is massed.—Page 521.

Foundry that lost $6,000 *in one year put in a cost system and is now on a paying basis.*—Revelation of costs enabled leaks to be stopped. A good cost system permits the foundry to avoid unprofitable work and to quote business-getting prices on jobs it can handle profitably.—Page 493.

Takes uncertainty out of tempering by preparing chart showing correct temperature to use for steel of a specific chemical analysis.—Thus steels of varying analyses are made to meet the required physical specifications.—Page 489.

Sand molds for pig iron are automatically made by new German machine.—Sufficient pig molds to accommodate 45 gross tons of iron are made in 30 min.—Page 492.

Saves half of floor space by installing continuous mold-handling and sand-conveying systems.—Only one-fourth of the flask equipment previously used is required with the new method. Production is increased and costs lowered.—Page 500.

Looks for a moderate decline during first half of year.—Dr. Haney sees no prospects of a severe downward trend.—Page 512.

Has the peak of automotive expansion been passed?—Motor car makers are proceeding cautiously, says Dr. Haney, in view of increasing evidence that a point of saturation in the development of original purchases among new users has been nearly reached.—Page 515.

January building contracts second highest on record for first month of year.—Total for 37 States east of the Rockies was nearly $385 millions, 16 per cent below January, 1926.—Page 547.

Succeeds in smelting iron ore in electric furnace.—Finely pulverized ore is permitted to fall through a vertical furnace chamber, containing baffles to reduce the speed of its passage. Large proportion of slag presents an obstacle yet to be overcome.—Page 498.

Make flue gas analyses to determine whether the maximum heating value is being obtained from the fuel used in heat-treating.—Much money can be lost in what goes up the chimney.—Page 488.

Rapid flow of materials through American foundries amazes foreign visitor.—Comments on the fact that the wide use of material-handling equipment not only reduces fatigue but permits the carrying of smaller stocks, with a corresponding reduction in capital charges.—Page 499.

Advocates charging manganiferous iron ore into the open-hearth to save ferro-manganese.—Some steel makers report that this practice also saves fluorspar and limestone and makes furnace linings last longer. —Page 507.

Employment statistics indicate that metal trades are busier.—National Metal Trades Association reports a gain of 2.3 per cent in January.—Page 508.

Disappearance of forward buying has eliminated the trade disturbances which formerly accompanied price declines.—Now buyers have no stocks to liquidate, with the result that price reductions have not created instability.—Page 520.

Is industry holding the coal strike threat too lightly?—Manufacturers are not stocking so freely as the coal producers think they should. Instead of mounting, as the threatened strike date draws near, coal prices are steadily going down.—Page 520.

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February 17, 1927

Keeping Abreast With Heat Treating

HEAT treatment, since long before it owned to the designation, or the particularity of the term was understood and accepted, has been a major object of attention by THE IRON AGE. To keep in the vanguard of the procession of developments, which have progressively taken on amazing scope, has been no mean task. Reader interest alone has shown that the efforts were justified.

In the last two issues notable research work in heat treatment of non-ferrous metals was described, of sufficient promise to deserve of this special reference. In the present issue we carry a message of the immediately practical sort, as to how the laboratorian and the heat-treater may cooperate to their mutual advantage and so to the advantage of their common employer. A constant lookout on our part and the generous attitude shown by the workers in the field toward imparting information has done much for the up-to-dateness of the literature of heat treating.

For News Summary See Reverse Side

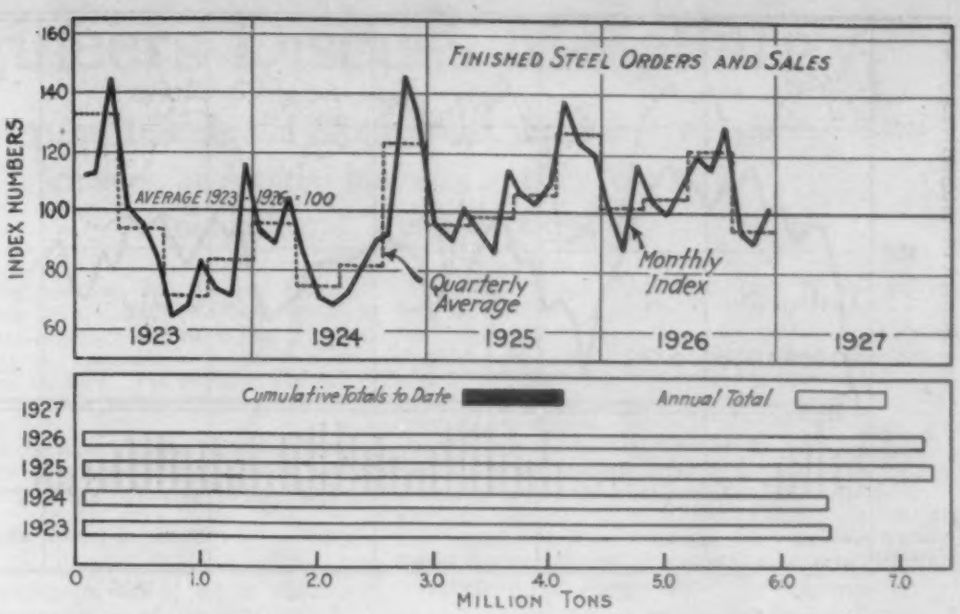

Fig. 2—Finished Steel Orders and Sales Turned Upward in December. Nevertheless, they showed the smallest December total in the chart and brought the fourth-quarter average to the lowest level of any fourth quarter since 1923

previous operating economies. Freight traffic decreased more than usual in January and freight car inquiries are now hardly satisfactory.

Large Demands from Some, But Not All, Industries

Oil production, too, has been large, and this fact, together with the freight car business, has meant a good demand for plates. *Mining* activity also has been well sustained, notably in the case of bituminous coal. General *manufacturing* activity, exclusive of iron and steel and automobile industries, continues in large volume.

On the other hand, the sharp decline in *automobile* production has gone far toward offsetting the foregoing factors. It fell in December to the lowest point of 1926 and nearly to the low point of 1924, making due allowance for seasonal conditions. The sales even of General Motors Corporation showed an unusually sharp decline in December. Some seasonal expansion is now going on in the automobile industry, but the makers are proceeding cautiously, and properly so, in view of the increasing evidence that the peak of expansion in the automobile business has been passed, and that a point of saturation in the development of original purchases among new users has been nearly reached.

It is true also that floor space in *building* contracts failed to show any such recovery in December as in either of the last two years, and was far below a year ago. January figures showed a decline. The effect of this situation is seen in the curtailment in structural steel shops and competition in structural steel prices. It appears, also, in the weakness in the market for nails.

Machinery Prospects Not Encouraging

Orders for *machine tools* are a good index of the trend, and these declined sharply in December. January, too, was, according to all reports, not a good month in comparison. Our index of machine tool orders in December was only 134 per cent of the average for 1922-1924, against 174.7 in November and 162.4 a year ago.

Finally, it must be noted that, considering the season, the gross income of *farmers* has been only fair and considerably below a year ago. Meanwhile the purchasing power of the farmer's dollar has become increasingly unsatisfactory, falling in December to the lowest point of the year—in fact, to the lowest point since early 1924. The broad trend of farm purchasing power was downward throughout the second half of 1926. Easy money conditions to some small extent may help the farm machinery demand, but, on the whole, not much is to be expected from that quarter, except in the export field.

Quarter's Orders Lowest Since 1923

ONE outstanding fact about our composite index of finished steel orders and sales (see Fig. 2) is that the fourth quarter of 1926 was the lowest fourth quarter of any year since 1923, and the total orders

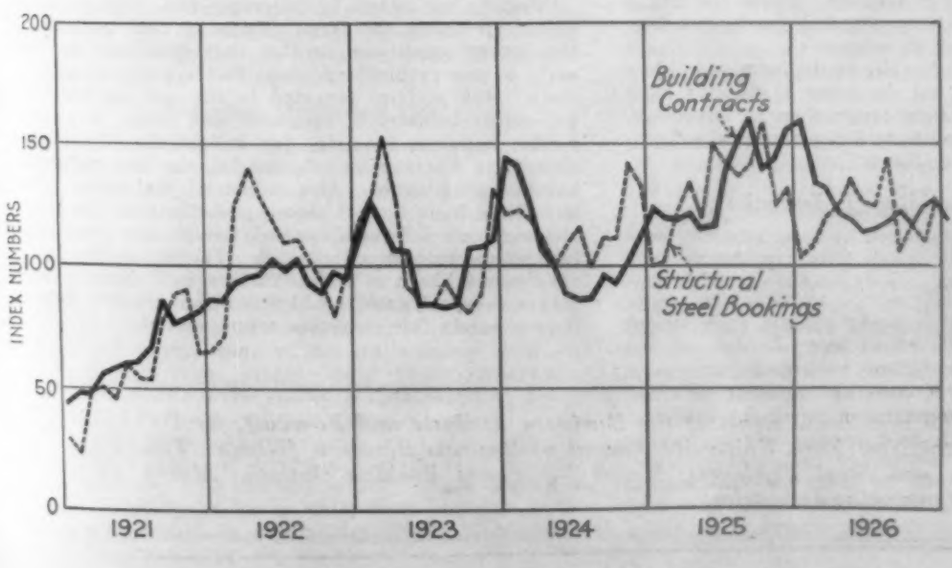

Fig. 3—Structural Steel Bookings Moved Upward in December to Meet the Building Contract Level. In January, building contracts dropped moderately. The prevailing trend, both in building contracts and in fabricated structural steel, is downward

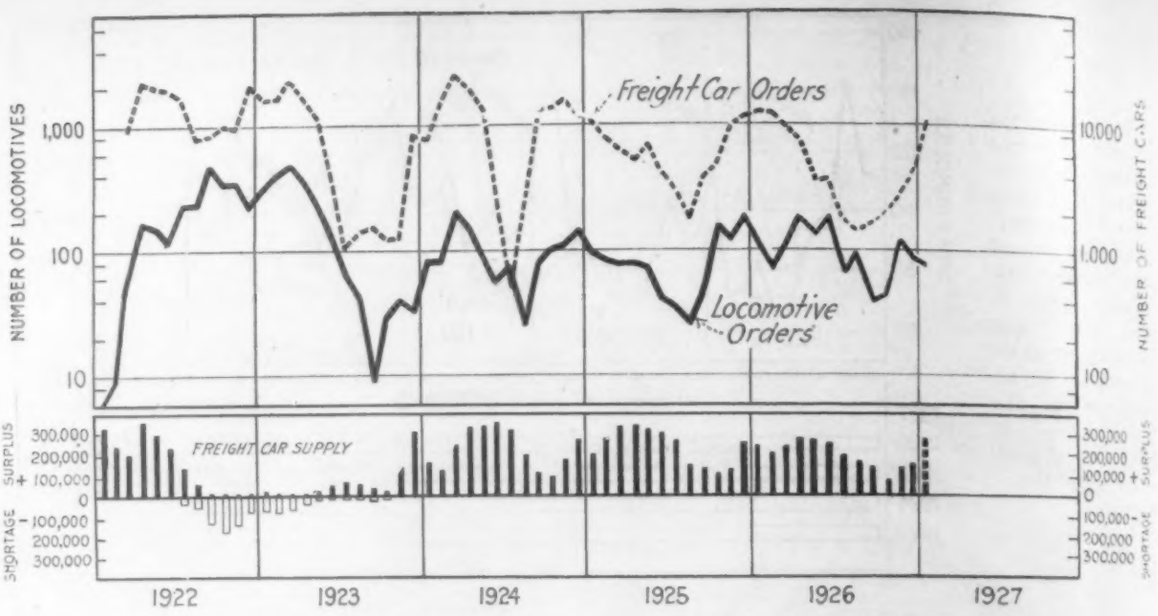

Fig. 4—Freight Car Orders Have Shown a Healthy Upward Tendency Since Last Summer and in January Exceeded the Same Month in Any Recent Year. Orders for locomotives, however, are far from satisfactory. Both curves are plotted as a 3-month moving average

and sales in 1926 (as forecast) fell short of the total for 1925. The year 1926 is the only year on our records in which the fourth quarter fell behind the third quarter. This decline was chiefly due to the extraordinarily sharp drop in October, but some further decline occurred in November, and the December recovery fell far short of that in December, 1923.

In December the showing was not entirely bad. The gain in that month is in contrast with declines in the same month of 1924 and again in 1925. But it remains true that December, 1926, showed the lowest volume of sales and orders of any December appearing on the second chart. In view of the moderately unfavorable prospect as to activity in the chief iron and steel consuming industries, the statistics of orders and sales in January and February are not apt to prove favorable. Already we know that the large decline in the unfilled orders of the Steel Corporation indicates a decreased volume of sales.

Among the items that contributed to the December gain was a fair seasonal increase in the bookings of steel castings. Sheet sales also gained in December. Structural steel lettings registered a good seasonal recovery. The latter, however, was due to a relatively few large projects. Doubtless various public works, theaters, etc., will continue to support the demand for structural steel, but such support will be irregular. In fact, such irregularity has appeared already in the weekly reports for January. These indicate a large total volume for the month, but the figures fluctuated widely from week to week.

It is to be noted that, in spite of the increased orders and sales in December, all the items of finished steel included in the index were lower than in December, 1925. The decline ranged from 2 per cent in structural steel up to 25 per cent in sheets.

Decline in Buildings Is Irregular

BUILDING activity, measured by floor space in contracts awarded, declined in January, being only 53,263,000 sq. ft. against over 64,000,000 sq. ft. in December and 65,560,000 sq. ft. a year ago. Our adjusted index, 118.8 per cent of the average for 1921-25, compares with 127.4 in December and 146.1 in January, 1926. Bradstreet's permit figures dropped 23.8 per cent in January and were 13.6 per cent under a year ago. The value of contemplated new construction, as reported by the F. W. Dodge Corporation, declined more than usual for the season, and was the lowest since January, 1925.

Nevertheless, lettings of structural steel increased in December and will probably show a further gain in the final figures for January. Evidently, while residences, hotels, etc., are likely to show a continued decline, large works of various kinds are tending to lend irregular support.

Car Orders in Good Volume in January

IN the railroad equipment business the situation at the end of 1926 was reversed from that earlier in the year. Formerly the locomotive orders were fair and the freight car business poor. More recently, the opposite relationship has existed. In January the number of freight cars ordered (17,196) exceeded the same month in any recent year, while the number of locomotives ordered (about 26) was the lowest since January, 1922. Locomotive shipments in January amounted to only 57, against 185 in December and 126 a year ago. Meanwhile, the unfilled orders were up a little, to 405, against 398 at the end of December and 653 last year. This indicates a decrease in new orders.

Freight car orders in December and January were good. Evidently the large volume of coal traffic and the rather small car surplus that developed in the early winter required additions to the carriers' rolling stock. The activity reported in the car construction and repair industry in December was large. Very recently, however, inquiries for freight cars have declined and the surplus of cars held by the railroads has increased again. Also industrial coal stock piles have been built up. It seems probable that the peak of freight car orders has passed, though they are likely to continue fair through March. The locomotive business seems likely to slump further in February, and then a seasonal gain should follow, but nothing better than a barely fair condition seems possible.

Schedule of the next installments of the ***Business Analysis and Forecast,*** *by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Feb. 24—Position of Iron and Steel Producers; March 3—General Business Outlook; March 17—Activity in Steel-Consuming Industries.***

Engineers Discuss Metallurgy

American Institute of Mining and Metallurgical Engineers, at Annual Meeting in New York, Hold Several Metal Sessions

BETWEEN Monday morning, Feb. 14, and Thursday evening, Feb. 17, the American Institute of Mining and Metallurgical Engineers had scheduled 146 papers, lectures, symposia and round-table discussions on technical matters. The occasion was the 135th meeting of the institute, in the Engineering Societies Building, New York.

Some of the main features of the iron and steel session and of the annual business meeting, both held on Feb. 15, are covered in the following paragraphs.

Iron and Steel Session

Six papers were scheduled for the iron and steel session on Tuesday afternoon, one of which was not presented, due to non-completion of the experimental work. This paper, "X-Ray Spectrometry," was to have been delivered by Dr. F. C. Langenberg of the United States Arsenal, Watertown, Mass. Papers which were presented include the following:

"Nature of the Chromium-Iron-Carbon Diagram," by Marcus A. Grossmann, chief metallurgical engineer Central Alloy Steel Corporation, Canton, Ohio.

"A Theory of the Cause of Blisters on Galvanized Sheets," by L. B. Lindemuth, consulting engineer, New York.

"Introduction to the Iron-Chromium-Nickel Alloys," by Edgar C. Bain, metallurgical engineer, and William E. Griffiths, research metallurgist, both with the Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

"Preliminary Report on the Nature and Some Properties of Low-Carbon Manganese Steel," by Dr. Vsevolod N. Krivobok, B. M. Larsen, William B. Skinkle and William C. Masters.

"Comparison of the Effect of Nickel and of Cobalt in Steel," by Franklin H. Allison, Jr., Pittsburgh.

Following the presentation of the five papers, with brief discussion on the first three, Dr. Bradley Stoughton, consulting metallurgist and head of the Department of Metallurgy of Lehigh University, presented the Henry M. Howe Memorial Lecture, his subject being "Alloy Steels."

After the Wednesday afternoon aluminum session, Prof. Cecil H. Desch of Sheffield University, Sheffield, England, presented the annual Institute of Metals lecture, his subject being "Growth of Metallic Crystals."

All of the papers read Tuesday afternoon, with the exception of Mr. Lindemuth's paper on blisters, were illustrated with lantern slides. Brief abstracts of the illustrated, preprinted papers will be given in THE IRON AGE. It happened that the report on "Low-Carbon Manganese Steel" was not preprinted. This paper was presented by Dr. Krivobok.

Low-Carbon Manganese Steel

It has long been the idea that steel containing a high percentage of manganese is very brittle. The paper read on this subject recorded the results of experiments on steels of manganese content from 1.2 to 3.5 per cent. In general, the steels were made by the use of a silica manganese, which was added in the furnace rather than in the ladle, because of difficulties in obtaining accurate compositions by ladle additions. The authors presented slides showing many of the characteristics of the steels they investigated, some of the slides being tables of physical properties, others being photomicrographs, while still others were plotted results showing effects of changes in the constituent elements.

Exceptional physical properties were shown for one steel, which had 0.29 per cent carbon, 2.43 per cent manganese and 0.45 per cent silicon. When this steel was quenched for ½ hr. in water from 1900 deg. Fahr. and then drawn 2 hr. at 600 deg. Fahr., it showed a proportional elastic limit of 125,000 lb. per sq. in., with an ultimate strength of 209,500 lb. per sq. in. This high tensile condition was associated with an elongation in 2 in. of 12.5 per cent and a reduction of area of 43.6 per cent.

Other steels of somewhat similar composition, but different treatment, showed varying results. One which was listed with 0.27 per cent carbon and about 2 per cent of manganese showed 134,000 lb. per sq. in. proportional elastic limit and 203,000 lb. per sq. in. ultimate strength. In this case, however, the ductility was much less than with the steel previously mentioned, for the elongation was only 6.5 per cent and the reduction of area 21.1 per cent.

Blisters on Galvanized Sheets

Mr. Lindemuth in his paper advances the theory that blisters on galvanized sheets result almost wholly from moisture taken from the atmosphere or from the pickling or washing operation. When this moisture is expanded into superheated steam in galvanizing, its increase in volume (2244 times) is so great that it cannot escape with sufficient rapidity through the small opening where it entered as moisture. The pressure forces the sheet apart along lines of lamination found in practically all flat steel sections rolled comparatively cold.

Experiments brought out in logical manner the relation between moisture and blisters. Among other things it was shown that sheets dried at about 400 deg. Fahr. before pickling and galvanizing developed less than one-thirtieth as many blisters as sheets from the same pile which were not so dried. Three methods of procedure were suggested to prevent formation of blisters:

1. Manufacturing steel so dense as to be impervious to water.

2. Enlarging the opening through which moisture enters the steel, sufficiently to allow the escape of the steam generated without creating undue pressure.

3. Drying the sheets before galvanizing.

Mr. Lindemuth considers the drying of the sheets the most obvious solution, and, from observations made in practice, the most efficient, also.

New Officers Announced

Officers elected Feb. 15 included the following: President and director, Everette L. DeGolyer, 65 Broadway, New York; vice-presidents and directors, Dr. George Otis Smith, Washington, and F. Julius Fohs, 51 East Forty-second Street, New York; directors, Frank H. Crockard, president Woodward Iron Co., Woodward, Ala.; J. O. Elton, manager International Smelting Co., Salt Lake City; Daniel C. Jackling, San Francisco; David Levinger, superintendent of development Western Electric Co., Chicago, and Richard Peters, Jr., Chester, Pa.

President Samuel A. Taylor presided over the annual business meeting, at which the election of officers was announced and a considerable number of official reports were read. Gratification was expressed at the acquisition recently of the Winchell Library, through the courtesy of Mrs. Winchell and the Anaconda Copper Co. Considerable discussion of a somewhat lively nature followed the announcement that it probably would be necessary to increase the dues.

Charles F. Rand, treasurer, pointed out that the expenses for the current year, at $195,000, had almost precisely balanced the income. A small surplus was realized through profit on the sale of some securities. For next year, however, Mr. Rand stated that there would be a deficit of approximately $11,000, on the

basis of careful estimate of both prospective income and the budget requirements. The tentative proposition of a special committee was to increase the annual dues from $15 to $17.50. There is also a strong effort under way to obtain an endowment fund of $1,000,000, from the income of which certain institute activities can be financed.

Problems of the Coal Industry

At the conclusion of the business session, Walter Barnum, president of the National Coal Association, presented a paper discussing in broad terms the general situation of the bituminous coal industry in the United States. He pointed out the difference between conditions here and abroad with regard to the employment of trained engineers in all responsible positions. He stated that coal is mined in the United States at the lowest price to be found anywhere in the world.

He expressed the belief that the "over-development" of the bituminous coal industry, so-called, is largely a case of exaggeration rather than fact. Estimating the capacity to produce, of the mines now in existence, with the equipment which they have, at 791,000,000 tons per year, and comparing this with the production figure of 578,000,000 tons in 1926, gives a ratio of output to capacity of about 73 per cent. This compares favorably with similar ratios in other lines of effort.

A Measure of Engineering Progress

Some of the progress made in the bituminous industry was traced by Mr. Barnum. For instance, in 1850 about 1¾ tons of coal was left underground for each ton mined, due either to difficulties in getting at it, or to the need of leaving support for the roof. In 1921 only ½ ton was left underground for each ton mined. A combination of engineering and mechanization of the mines was credited with this great improvement.

Coal production in a period of half a century increased from 20,300,000 tons, as the average for the decade 1865 to 1874, to 499,700,000 tons, the average for the decade 1915 to 1924. Two-thirds of all the bituminous coal mined is used in manufacturing, or by the railroads. The figures given were 228,500,000 tons for manufacturing establishments and 138,000,000 tons in transportation.

As to the future, a greatly increased use of pulverized coal and an increased use of coke were predicted, the latter on account of the highly valuable recoverable by-products. Because of the relatively slight margin in petroleum reserves, the speaker stated that the return movement from oil to coal as a fuel is already under way.

Small Lot Buying Burdens Steel Makers

Walter C. Carroll Discusses Effect on Industry at Chicago Conference on Hand-to-Mouth Purchasing

AT a conference on hand-to-mouth buying held this week at Chicago under the auspices of the Metropolitan Life Insurance Co., Walter C. Carroll, vice-president Inland Steel Co., Chicago, discussed the question from the steel manufacturer's standpoint. Recounting the conditions which led to the practice of frequent small lot buying and pointing out its effect in adding to costs and reducing profits, he said "it is not unreasonable to predict that a sustained increase in buying of steel products of as much as 15 per cent during a three months' period would not only completely eliminate the practice of hand-to-mouth buying, but with stocks practically depleted, the pendulum, which we believe has swung too far, would beat a hasty retreat in the other direction."

Frequent Roll Changing Not Indicative of Lack of Demand

His address, save for the sketch of the developments leading to the short-range buying practice, was as follows:

"The fact that rolling schedules could not, in many instances, be made up more than a day or two before the actual rolling was to begin, was frequently interpreted as a lack of demand, and it is possible that the increased anxiety on the part of the steel manufacturer prompted him to under-estimate the value of his product, which fact, naturally, would contribute to a weak market.

"During the past years, when a backlog was considered essential, rolling schedules and all of the necessary arrangements in the mill were completed two or three weeks in advance, and there was a greater stability to the market. This lent confidence to the buyer and seller alike. The backlog was not without its faults, and fluctuations, when they occurred, were perhaps more pronounced and of longer duration, but the steel producer was given an opportunity to adjust his operations from the blast furnace through to the finished product. Today the slightest decline in demand leaves no time for adjustment in the steel works and contributes to losses which cannot be figured.

"There are many arguments which can be advanced which are decidedly favorable to small lot buying, but such arguments relate principally to the distributer or fabricator and the ultimate consumer. The steel producer, however, has not found it possible to apply hand-to-mouth buying to his supplies of iron ore, coal, limestone and the other principal items which constitute his inventory. He must lay in these supplies months in advance. This is particularly true of iron ore. He must stand ready with a complete stock of raw materials sufficient to insure continuous operation and the size of the inventory cannot be related in any way to the size of the orders which may be received for production.

"It would make an interesting exhibit if we could show, on a structural mill operation for example, the extent to which rolling costs have been affected but it would be difficult to do so, for in the larger plants in this country during this period of transition, many millions of dollars have been spent in the interest of greater efficiency and lower costs. These economies have been realized on the one hand, while the character of the orders have made it impossible for the steel producer to enjoy those profits to which he is justly entitled by reason of his foresight and expenditures.

"Steel producers do not wish to supplant the distributer or encroach upon his prerogatives, but the buying of small lots tends in that direction. The buyer who orders small lots has not yet taken into consideration the fact that some extra compensation is due the steel manufacturer. The practice has been of such gradual growth, and industry has been proceeding at such a rapid pace that few have accepted the opportunity to analyze or offer a solution to the present situation.

"In summing up, it appears that the advantages are in favor of the consumer. The distributer has operated advantageously by reason of smaller stocks and a more liquid position. The steel manufacturer has carried a burden which, in spite of a great aggregate

demand, is reflected in very meager profits. In the last analysis, the law of supply and demand will govern."

Mr. Carroll then concluded his address with the statement quoted above respecting what might easily happen with a small increase in buying sustained over three months.

British Impressions of American Foundries

LONDON, ENGLAND, Feb. 4.—W. Jolley (British Westinghouse Co., Manchester), at a meeting in Manchester of the Lancashire branch of the Institute of British Foundrymen, described impressions gained by him in a recent visit to plants in the United States. While in casting big jobs he considered British foundries were more advantageously placed than American, the molding machines used in the latter "left us far behind in the matter of output."

On the repetition basis one well-known plant visited by Mr. Jolley had a daily production of 1500 tons of castings, necessitating the use of 18 cupolas each of 100 in. in-diameter, two such batteries being run alternately. Direct metal from the blast furnaces had been tried without success, but the installation of a 50-ton electric furnace was proceeding to get over the difficulty and labor of pigging and re-melting. Mr. Jolley considered the locomotive type of sand-slingers a great improvement on what were known in England, but required specially large shops to accommodate and operate them successfully.

Labor conditions in American foundries were described by J. T. Kay (an iron molder employed in Birmingham) at a meeting of the Birmingham branch of the institute. He did not consider we had much to learn from the United States about the technicalities of the foundry but he admitted that great strides had been made there as a result of cooperative methods, and there was no doubt that a splendid understanding existed between the employer and the workman. He thought we might adopt their methods of cooperation to a greater extent than was the case today.

He noted the remarkably few apprentices, and on inquiring at the General Electric Co.'s works where they were going to obtain their molders in the future, the reply was: "We can always get as many as we want from Great Britain." In Mr. Kay's opinion the time was rapidly approaching when trade unions would become unnecessary in the United States, owing to the exceedingly high standards of labor. The American workingman performed half the amount of hard work that his British confrere did because of the perfection of mechanical appliances and having everything ready at hand.

Railroads Propose New Rates for Chicago Switching District

WASHINGTON, Feb. 15.—Railroads serving the Chicago district have filed with the Interstate Commerce Commission a sixth-section application to put into effect upon less than statutory notice (30 days) lower rates on iron and steel in that district than those proposed in tariffs which previously were filed and are now under suspension. The rates per 100 lb. now proposed by the railroads are 3c. for single-line hauls, 3.5c. for two-line hauls and 4c. for hauls involving more than two lines. These compare with rates previously proposed of 3c. for single-line hauls, 5.5c. for two-line hauls and 6.5c. for hauls involving more than two lines. Present rates are 2.5c. and 3c. It is understood that iron and steel makers in the Chicago district have agreed to the rates just proposed. The railroads asked that the commission set aside the hearing in Chicago beginning tomorrow on these rates, but this request was not granted. The hearing will be conducted by Commissioner Campbell and Examiner Bardwell and will embrace the iron and steel rates in the Chicago district as well as other iron and steel rates.

Control Based on Forecasts Discussed at Management Meeting

Business control based on forecasts of external conditions was a major topic discussed at one of the first two sessions of the winter convention of the American Management Association, which opened Tuesday, Feb. 15 and will continue through Friday, Feb. 18.

An address by Donaldson Brown, vice-president of the General Motors Corporation, New York, on "Decentralized Responsibility with Centralized Coordination," was of outstanding interest at the opening session of the convention.

"The Organization of Control of Production and Distribution Based on Forecasts of External Conditions," a paper by R. B. Flershem, vice-president and general manager of sales of the American Radiator Co., New York, was well received. The importance of applying as well as making forecasts was stressed in Mr. Flershem's prefatory remarks—the application of forecasts being regarded as even more difficult than the making of them. The executives and administrative organization and functions developed to carry out the plan of the company were outlined in some detail and the results of the plan which has been in operation for over a year, were enumerated. Among the beneficial results are: marked improvement in service to customers; saving of money in freight charges; satisfaction of manufacturing department with production schedules; and reduction of inventory.

M. C. Rorty, vice-president of the International Telephone & Telegraph Co., New York, in his written comment on Mr. Flershem's paper, read by W. J. Donald, managing director of the Association, said: "It is helpful to distinguish three elements in such control of industrial operations. The first aims at maintaining a unity of policy and purpose and a unified company front in all parts of an operation or series of operations. The second element, closely related to the first, aims at securing a quick and balanced responsiveness to changing conditions which affect operations. The third element aims at making deliberate and carefully studied forecasts of what changing conditions may be." Mr. Flershem's paper, he pointed out, illustrates the practical application of these generalizations.

Others discussing the paper were J. H. Barber, assistant to the president, Walworth Co., Boston, and Richard Mayer, American Radiator Co., New York. E. E. Lincoln, chief statistician, Western Electric Co., New York, presided at the session.

Sessions under the auspices of the Association's office executives' division will be held Feb. 17, and there will be a conference on personnel technique on Friday, Feb. 18. Topics at the later sessions will include: Ethics and methods of handling references; advising applicants, status of personnel men in the organization; and the scope of personnel department activities.

British Iron and Steel Output Gaining

LONDON, ENGLAND, Feb. 15 (*By Cable*).—The production of pig iron in January was 434,600 gross tons and that of steel ingots and castings was 730,700 tons. This compares with 98,000 tons of pig iron and 319,300 tons of steel in December, when the industry was recovering from the coal strike which ended in November.

The comparison of the January production with the monthly output in recent years is shown by the following table:

	Pig Iron, Tons	Steel Ingots and Castings, Tons
1913—Average monthly...	855,000	688,600
1920—Average monthly...	669,500	755,600
1922—Average monthly...	408,500	490,100
1923—Average monthly...	620,000	706,800
1924—Average monthly...	609,900	695,100
1925—Average monthly...	519,700	616,400
1926—Average monthly...	202,500	296,700
1927—January	434,600	730,700

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Price Declines Do Not Disturb

STEEL prices have been declining of late. Not all lines have receded but several have, and in varying amounts. It is only in very recent years that an entirely new style in buying and selling steel has come into vogue, and it is well to reflect how much better the market bears these declines than was the case in the old days.

Many sellers of steel may have regretted the disappearance of the far forward buying that used to characterize steel, although in the prosperous times of the past two years, particularly the last year, they have found much to reconcile them to the change. Apart from that, however, the great principle of compensation is now seen. In the old days, by whatever reason forward buying created confidence and smoothed the ways of trade, by the same token sliding prices disturbed trade and made much trouble for everybody, buyers and sellers alike.

These recent price declines, on the contrary, have not disturbed trade. Buyers have not had occasion to take alarm and proceed to liquidate stocks, because they have had no stocks to liquidate, nor to cancel contracts or suspend deliveries, because they had little of such engagements. Consumption must be taken care of and that necessitates current buying. The unusual steadiness of steel production of late is not attributable to consumption having been steady, but to production and shipments having kept in line with actual consumption. In the old days it was not thus. The curve of production had much greater swings than the curve of consumption.

There is another divergence in the course of the market now as compared with its course in the old days. Then it was the settled habit of steel products to move more or less together. If one line declined in price that was virtually a signal for other lines to yield, and it was the same with advances. The reason was clear. Commitments by the buyer were dependent upon his having confidence in the general steel market. If a finished steel product he did not use gave way, he felt reasonably certain the line he did consume would in turn decline, and the same view held good with advances. It all worked back to the steel ingot, the one commodity that was not the subject of market trading to any extent, yet virtually controlled semi-finished and finished products.

Nowadays each tub stands on its own bottom. Each line makes its prices itself, in open market trading. The sentimental influence of one commodity on another may not be entirely lost, but it has been vastly reduced.

One thing that is absolutely lost is the old spirit that in order to have price advances the prices must first go too low, bringing about a reaction. The producers entertain no such notion, nor if they did would the buyers subscribe to the idea. Naturally the seller may have much hope of an upward reaction, but he bases no conduct upon it. He will not sell one ton of steel too cheap now in order to pave the way to obtaining later a better price for several tons.

No Coal Strike Excitement

AS the bituminous coal strike of April 1 approaches, coal prices steadily go down. The weighted average of *Coal Age*, steady for the first three weeks of the year, has since had three successive weekly declines, being now $2.16 against $2.14 a year ago, while some wages are higher now than then and none are lower.

Current estimates are that a large amount of stocking is in progress, but the manner of these estimates explains the prices, as they are in general based upon observance that production is far above estimated current consumption. Apparently more than 2,000,000 tons a week have been going into stocks lately.

Reports are that the public utilities are stocking freely, the railroads somewhat lightly, and industrial companies in general quite lightly. Coal producers naturally suggest that the public is not taking the strike so seriously as should be done. Outside observers may assume that those who are not stocking freely have definitely formed opinions that the strike is not likely to amount to much.

There is another view to take. It is quite businesslike to prepare for all contingencies when

demand is good and when large profits will be lost if operations are curtailed. When business is not so good, when profits are relatively meager, it is not businesslike to pay out so much for insurance. Perhaps, indeed, some consumers of coal are looking upon this coming coal strike as a possible tonic to their business.

When the coal strike of 1922 was in its third month some men quietly remarked that perhaps it was a blessing in disguise. It may have been only a coincidence, but the statistical record is that steel prices had been declining for about eighteen months, up to March, 1922, and then started on a prolonged advance. It is also a matter of record that, just one month before the strike of April 1, 1922, the coal market softened. Consumers may not have stocked so much as events indicated they should have stocked, but there had been enough completion of programs a month in advance of the date to affect the coal market adversely.

As to the length, breadth and outcome of the prospective strike so many opinions have been expressed that it would be hard for the events not to fit any of the opinions. Still, the unexpected sometimes does occur.

Accidents in Small Industries

IT has been proved that the percentage of accidents and their degree of seriousness measured in lost time are considerably higher where few men are employed than in large works. The latest survey conducted by special investigators of the industrial division of the National Safety Council, covering 299 small plants in Michigan, Illinois, Indiana, Kentucky, Ohio and Rhode Island, reveals that "the average small plant executive declares and actually believes he has no accidents in his plant. He is too busy to pay any attention to accident prevention. Small plants pay their compensation insurance premiums, and, after complying with the demands of the insurance companies and State officials, assume they have no further responsibility to safeguard their employees. These executives do not realize that accidents cost them approximately four times as much as they cost the insurance carriers."

To quote E. G. Plowman, industrial relations adviser of the Associated Industries of Massachusetts, "these smaller companies do not at the present time find it profitable or worth while to engage in any extensive safety work. In many of them it would mean capital outlay for machine guards, concrete floors, etc., which would put the firms out of business. In many other companies the managers are skilled only in sales and production and cannot take time to become skilled in avoiding accidents. In a word, it is cheaper for them to allow accidents to happen."

Mr. Plowman's suggestion, which he himself terms visionary rather than practical, is to amend the compensation acts so that the casualty companies would organize their methods so they could spend money in small plants in preventing accidents, rather than in satisfying claims begot of injuries to employees. Perhaps some relief might be brought about by stricter factory laws or insurance rules, compelling in the small plant what is the usual practice in the large plant. But, as Mr. Plowman points out, such procedure might spell ruin for some owners.

One reason, which these investigators do not mention, why some small insurers take little interest in lowering accident hazard is that their insurance rate is not subject to reduction. With large employers the insurance companies conduct periodic inspections of plants and their accident records, and when an "experience" is one of careful prevention methods and few accidents, then the premium rate is lowered to a figure below the standard rate for that particular industry.

The "minimum" rate paid by the firm with a small payroll never varies. There might be no accident for years and the plant might be fully guarded against hazard, but the minimum rate, under the rule, remains a constant. The reason for this, according to the insurance men, is that the cost of inspecting small plants would be prohibitive, for the process is a complicated one, comprising almost innumerable plant factors.

As a matter of fact the average owner of a small shop or factory occupies one great advantage if he cares to interest himself in accident prevention. In most such establishments, office and factory are closely affiliated. The manager has only to step from one room into another to be among his employees. Let his interest be aroused and he is a keen and watchful observer. He knows his people pretty well, and he ought to achieve a closer approach to the experience of the large plants than he does.

Old Age Pensions Operating

THE operation of the Wisconsin old age pension act, which is being watched by economists with much interest, as an example of a non-contributory system of caring for the needy aged, has thus far been disappointing. The trouble with the law, from their point of view, is that it is permissive. Any county in the State may accept its provision by a two-thirds vote of its county board. But only five of the seventy-one counties have adopted it, though the act has now been in force since June 1 of last year.

The law is not radical, except in principle. The State bears one-half the cost, the county the other half. The beneficiary pays nothing, neither does the employer. The county board may pay not more than $1 a day to the pensioner, hardly enough these days to keep the wolf from the door, yet enough to run into huge figures should the law be adopted generally. Up to date the five counties have pensioned 261 persons, all over 70 years of age, nearly one-half of them women. Of the 261 those formerly engaged in manufacturing and mechanical industries number 94, and of these 16 are still able to continue some sort of work in their former places of employment.

Something might be said for old age pensions in which the beneficiary has contributed to the fund in his productive years, with industry and State adding their shares. But where State and county alone, in other words the public at large, provide all the money, there seems little difference

between a pension and other forms of alms. One does not begrudge comfortable support for the aged. Perhaps the fact that help takes the form of a pension detracts less from self-respect. Industrially the Wisconsin system has no vital interest excepting as it may be another of the entering wedges which from time to time have added to governmental paternalism.

Hardness and Heat Treatment

ABOUT ten years ago, announcement of the discovery of the age-hardening of duralumin and its causes opened up a new field in the realm of heat treatment. By regulating the composition it was found possible to cause the precipitation in the alloy of microscopic particles of compounds of silicon and magnesium or of copper and aluminum in the presence of copper. These minute compounds, under certain conditions of temperature and time, precipitate in the body of the alloy and impart hardness and strength. The notable feature is that some of these changes take place at room temperature and require a fairly long time—hence the term age-hardening. The discovery of this principle has been one of the most striking in the brief history of the science of heat treatment.

Within the last two or three years another notable discovery of the application of this principle to other alloys was made by an American investigator. By introducing in copper certain silicides of chromium and nickel and other elements, the hardening of copper and the increasing of its strength has been made possible. Details of this development were published for the first time in THE IRON AGE last week. These alloys of Corson are formed by the precipitation of these silicides in the metal after suitable heat treatment. The process is hastened, taking place at different degrees of temperatures above the atmospheric.

In a somewhat similar manner the hardening of iron by tungsten and by molybdenum has been developed by other American metallurgists in relatively recent years. The feature here is that these hard iron-tungsten alloys are being substituted for high-speed steel as dies for drawing wire, having a greatly prolonged life. Lead also has been rendered hard in a similar manner by the aid of antimony.

These achievements are testimony in respect to the contributions to science and industry made by heat treatment, and they lend confirmation to the arguments that explain the Jeffries-Archer theory of the hardness of metals by slip interference. In any event, it would appear that a strong, light alloy has been made available for airplanes, that the age-long problem of hardening copper has been solved, and that iron alloys have been produced which are not dependent entirely on carbon for their hardening properties. The investigations certainly prove, if that were needed, that heat treatment of non-ferrous metals is prolific of intensely practical results.

Junior Colleges and Engineering

AMERICAN engineering schools are somewhat concerned in the agitation which has sprung up in recent years for the establishment of junior colleges, so-called. One purpose of these is to relieve established colleges by transferring to this new class of institution the first year or two of the present engineering course, thus shortening it by that period.

Heads of engineering schools meanwhile have come to regard the ideal course as requiring an increase to five and preferably to six years. Instead of jamming into four years the work which, in studying for medicine or law, is spread out over a regular college course and several years in a post-graduate school, they would give their students a similar professional equivalent by an added year or two. It is fairly certain that none of the engineering schools of first rank will agree to accept in the place of the regular freshman or sophomore work what an applicant for admission has done in a junior high school.

SOME 1,499,475 foreigners have applied for immigration visas according to the State Department. Of these 1,142,000, more than three-fourths, are in southern and eastern Europe, or the Near East. Their quotas, it appears, are covered for some twenty years. In the face of these figures, there is a clamoring for another change in the immigration law. The vociferous friends and relatives of the large numbers should not be allowed to reduce the chances of admission of the remaining one-fourth whose adherents are not so noisy and perhaps not so adroit politically.

Total Ohio River Traffic Gains, Although Steel Movement Declines

In 1926, 19,159,788 net tons of freight were moved on the Ohio River, according to the preliminary figures compiled by the United States Engineers' offices in Pittsburgh, Huntington, W. Va., Cincinnati and Louisville, Ky. This total compares with 15,737,015 net tons in 1925. Sharp increases in the tonnage of coal and sand and gravel handled account for much of this gain. The iron and steel tonnage for the entire river decreased 47,556 tons in 1926 as compared with 1925. For the Pittsburgh district alone there was a loss of 62,182 tons. The figures by districts, which cover tonnages originating within each district, including receipts from tributaries, and carried on the Ohio River, compare as follows:

Commodity	Pittsburgh District		Huntington District		Cincinnati District		Louisville District		Totals	
	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
Coal	4,082,739	5,273,422	1,962,446	2,522,327	9,864	14,366	472,813	440,050	6,527,862	8,250,165
Coke	393,248	350,200	3,914	2,713	.....	.....	55	.....	397,211	352,913
Cement	1,600	9,860	95	1,276	50	125	18,837	19,342	20,582	30,603
Sand and gravel	2,645,221	3,268,793	2,209,511	2,194,480	352,155	372,268	1,647,588	2,743,914	6,854,475	8,579,455
Stone	15,975	4,600	151	.....	.....	.....	535,306	431,920	551,432	436,520
Iron and steel	377,403	315,231	100,921	130,340	1,607	474	54,886	41,226	534,817	487,261
Oil and gas	20,560	7,175	137,040	164,354	94,982	88,684	18,716	55,215	271,298	315,428
Logs and lumber	3,307	2,860	11,858	8,447	544	623	169,924	383,997	185,533	395,927
Packet freight	62,789	33,242	38,125	27,207	78,432	76,487	169,870	87,115	349,216	224,405
Unclassified	44,583	41,527	.....	7,965	.....	70	.....	37,546	44,583	87,105
Totals	7,647,325	9,306,900	4,464,061	5,059,106	537,634	553,457	3,087,995	4,240,325	15,737,015	19,159,788
Per cent increase		22		13		3		37		22

HEAVY TAX BURDENS

Some States Collect More Than the Net Income of the Corporations

QUANTITATIVE measure of the tax burdens imposed upon corporations by State and Federal authorities is had in a report by the National Industrial Conference Board, New York, showing figures for 1924. In that year the net income of corporations in the United States, before any taxes were deducted, amounted to $6,995,900,000. State, Federal and local taxes took $2,541,007,000, or 36.32 per cent of the total. Put in another way, what the authorities took in taxes represented 57.04 per cent of the net income remaining after taxes were taken.

In the great industrial States of New York, Pennsylvania, New Jersey, Ohio, Illinois, Indiana and Michigan the percentages were close to the average above given, or below it. In Massachusetts, on the other hand, almost 50 per cent of the net income was taken in taxes, the tax payments having been 99.14 per cent of the residue left after taxes were paid.

In Mississippi, Montana, Nevada, New Mexico, Oklahoma, Oregon and Wyoming more taxes were collected than the total net income of the companies. In Idaho and in South Carolina more than 91 per cent of the income went for taxes, while the tax collections for Arizona, North Dakota, Rhode Island and South Dakota were all above 70 per cent of net incomes. Of course, State and local taxes did not account for all of these deductions. Federal taxes were included, but there were several cases where the State and local taxes alone amounted to more than the net incomes of the companies, and other cases where they ran upward of 70 per cent.

Shipments of Mining and Industrial Electric Locomotives Heaviest Since 1923

WASHINGTON, Feb. 15.—For the quarter ended Dec. 31, 1926, mining and industrial locomotives to the number of 379, valued at $1,784,234, were shipped, according to reports to the Department of Commerce from ten firms, comprising practically the entire industry. Total shipments for 1926 were 990 locomotives, valued at $4,651,361, as against 744, valued at $3,592,368, in 1925, and 663, valued at $3,258,643, in 1924. In 1923 the shipments were well ahead of 1926, with 1355 units, valued at $5,821,454.

Of 1926 shipments, mining locomotives accounted for 871 units and $3,961,736, while industrial locomotives totaled 119, valued at $689,625. Of the mining locomotives, 653, valued at $3,209,787, were of trolley type, and 218, worth $751,949, of storage-battery type. Industrial users showed a preference for the storage-battery type, for shipments were 93 units, worth $404,001, compared with 26 trolley-type units, valued at $285,624.

Merger of Ohio Sheet Companies Effected

PITTSBURGH, Feb. 14.—The merger of Ohio sheet companies, which has been under negotiation for several weeks, became a certainty at a meeting of those interested held here late last week. Instead of embracing 90 or 100 hot mills, as originally contemplated, companies having a total of 69 mills have subscribed to the agreement, which provides that each of the companies will take stock in the new company in exchange for individual company stock and each company will leave sufficient cash in its treasury to give the new company enough working capital without recourse to new financing.

The new company is to be headed by W. H. Davey, president Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, which with its affiliated company, the Ashtabula Steel Co., Ashtabula, Ohio, and the Empire Rolling Mill Co., Cleveland, the Mahoning Valley Sheet Steel Co., the Waddell Steel Co., the Thomas Sheet Steel Co., and the Falcon Steel Co., all with mills in Niles, Ohio, have entered the combination. These mills have a rated annual capacity of 456,000 tons of sheets. The only steel-making capacity embraced is that of the Mansfield Sheet & Tin Plate Co., which has four open-hearth furnaces with a rated annual capacity of 185,000 tons of ingots and a yearly output of 165,000 tons of sheet bars.

The directorate of the new company will be drawn from the executives of the constituent companies.

The Superior Sheet Steel Co., Canton, Ohio, and the Newton Steel Co., Newton Falls, Ohio, mentioned at the outset of the negotiations as likely to be included, as were also the Chapman Price Steel Co., Indianapolis, and the Kokomo Steel & Wire Co., Kokomo, Ind., appear to have withdrawn, although it is understood that negotiations are continuing for a combination of the Superior, Kokomo and Chapman Price companies.

Swartwout Co. Enlarged by Merger

The Swartwout Co., Cleveland, maker of power plant equipment and ventilating machinery, has consolidated its factory and personnel with the S-C Regulator Mfg.

D. K. SWARTWOUT

J. M. BARRETT

Co., Fostoria, Ohio, also a maker of power plant equipment. The Fostoria plant of the Regulator company is to be discontinued and the equipment is to be moved to the Orrville, Ohio, plant of the Swartwout Co. Headquarters will be maintained at 18511 Euclid Avenue, Cleveland.

D. K. Swartwout, president of the Cleveland company, and a leading figure in bringing the two companies together, continues as chief executive of the merged organization. J. M. Barrett, president of the Fostoria firm, becomes a vice-president of the new company and D. K. Swartwout, Jr., is to be vice-president and general manager. W. E. Clement is secretary and treasurer and L. P. Russon is assistant sales manager.

New Industrial Publication

Monthly publication of the *Conference Board Bulletin* has been started by the National Industrial Conference Board, 247 Park Avenue, New York. It is an eight-page pamphlet containing statistical and economic information and illustrated with graphs. The principal article in the January issue, the initial number, dealt with the composition of the American working population in 1925. There were articles also on wages, hours and employment, as of November, and on changes in the cost of living, as of December. The publication is intended primarily to make currently available, in permanent form, results of original studies by the conference board which are not issued in the regular book publications of the board.

Iron and Steel Markets

Steel Trade Testing Out Demand

Price Levers Have Lifted Bookings But Stability Awaits on Measure of Consumption—Production Exceeds Shipments and Bookings—Pig Iron Still Weak

BUYING of steel has now shown five weeks of a slow, steady gain. Apparently it required price concessions, as was not so clearly believed before, to start the reaction from the preceding weeks of sharp curtailment.

Shipments continue to exceed bookings, and operations, which indicate a further expansion, are in excess of shipments. Possible coal strike complications do not seem to be an influence in pushing output, but rather the economy of high-scale production, though it builds up stocks of skelp, sheet bars and other forms of semi-finished steel.

The Steel Corporation, which is above an 85 per cent rate of operations, put into service a South Chicago stack, and the Corrigan-McKinney Steel Co. at Cleveland has blown in two blast furnaces. Steel ingot production has increased among several independent companies. The increased demand for steel has lately been for railroad car builders, tanks, buildings, railroad structures and automobiles, in about the order named. Chicago reports specifications as 30 per cent ahead of the first half of January and the week the largest, with one exception, since March.

Prices still are seeking equilibrium, but they are no lower than a week ago. With the continued practice of the sharply shortened purchasing, stability is held to be dependent on either further expansion in buying or better evidence than now afforded of the measure of consumption over the next few months.

The threat of the coal strike has resulted in heavier stocking of coal but has not prevented further price recessions. Greater strength, however, has been shown by Connellsville coke, and this has been reflected in the firm stand taken by Valley producers of pig iron. A purchase of 5000 tons of basic iron for an Ohio plant failed to bring out concessions from $18, furnace, by Valley makers. At Cleveland the market is steadier, and sales for the week totaled 37,000 tons. In some other districts prices have shown fresh weakness. Chicago foundry and malleable iron have declined 50c. a ton to $20, base furnace, and southern Ohio foundry iron has receded $1 a ton. In New England and New York competition has grown even more tense, and on foundry iron $17, base Buffalo, has become a commoner quotation. On sales of about 25,000 tons of basic iron in eastern Pennsylvania the market gave way 25c. a ton.

A merchant furnace in Alabama has been blown in.

Structural bookings took about 37,500 tons within the week and included 8850 tons for buildings for New York gas companies and 6500 tons for a New York State office building at Albany. A good deal of work will soon be out for bids, including a New York building requiring about 30,000 tons. A New York church calls for 7200 tons.

The Chesapeake & Ohio is asking for prices on 7500 tons of steel, mostly car plates and shapes, for 500 gondola cars. An eastern railroad has ordered 2500 tons of tie plates. Miscellaneous rail business amounting to 7000 tons is reported from Chicago.

Order books for large diameter pipe are well filled for the next two or three months. Last week's business included over 100 miles of 6 to 16-in. line pipe. An oil company is now inquiring for more than 400 miles of 20 and 22-in. pipe, requiring about 125,000 tons of steel.

Sheet mills are among those at a higher operating basis. Those which have bookings sufficient for two or three weeks or longer have taken a firmer price stand. From others there are such irregularities as 2.65c., Pittsburgh, for black sheets for Detroit delivery, against 2.80c., the more common quotation; 2.05c. for blue annealed sheets, against 2.20c., and 3.65c. for galvanized, against 3.75c.

Heavier demand for both hot and cold-rolled strip steel has resulted in sales which compare with those of November. Delivered prices are commonly ruling. They figure back to 2c., Pittsburgh, for the wide hot-rolled product, 2.20c. for the narrow, and 2.90c. for the cold-rolled.

Wire business in particular was increased by price cuts, and weakness persists. Large lots of nails have again sold at 2.50c., though 2.55c. is regarded as the market.

Offerings especially attractive from the rolling standpoint can be closed at $1 a ton below 1.90c., Pittsburgh, in bars and shapes, and 1.85c. in plates.

Specifications for semi-finished steel have been heavy and producers have fair backlogs of orders. No new price deviations are reported.

THE IRON AGE pig iron composite price has fallen to $18.96, from $19.13 last week. This equals the low figure of 1925 and is lower than at any other time since the spring of 1922. Finished steel, also at the lowest point since 1922, remains at the 2.374c. per lb. reached last week.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 15, 1927	Feb. 8, 1927	Jan. 18, 1927	Feb. 16, 1926
No. 2, fdy., Philadelphia	$21.76	$21.76	$22.26	$23.76
No. 2, Valley furnace	18.50	18.50	18.50	20.50
No. 2, Southern, Cin'ti	21.69	21.69	21.69	25.69
No. 2, Birmingham	18.00	18.00	18.00	22.00
No. 2 foundry, Chicago*	*20.00*	20.50	21.00	23.00
Basic, del'd eastern Pa.	*21.00*	21.25	21.50	23.00
Basic, Valley furnace	18.00	18.00	18.00	20.00
Valley Bessemer, del'd P'gh	20.76	20.76	21.26	22.76
Malleable, Chicago*	*20.00*	20.50	21.00	23.00
Malleable, Valley	18.50	18.50	18.50	20.50
Gray forge, Pittsburgh	19.76	19.76	19.76	21.76
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	100.00	100.00	100.00	115.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	35.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	35.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	36.00	36.00
Forging billets, P'gh	40.00	40.00	40.00	40.00
O.-h. billets, Phila	38.30	38.30	40.30	40.30
Wire rods, Pittsburgh	43.00	43.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.22	2.22	2.22	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.90	1.90	2.00	2.00
Steel bars, Chicago	2.00	2.00	2.10	2.10
Steel bars, New York	2.24	2.24	2.34	2.34
Tank plates, Pittsburgh	1.85	1.85	1.90	1.80
Tank plates, Chicago	2.00	2.00	2.10	2.10
Tank plates, New York	2.19	2.19	2.24	2.09
Beams, Pittsburgh	1.90	1.90	2.00	1.90
Beams, Chicago	2.00	2.00	2.10	2.10
Beams, New York	2.24	2.24	2.34	2.24
Steel hoops, Pittsburgh	2.20	2.20	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Feb. 15, 1927 Cents	Feb. 8, 1927 Cents	Jan. 18, 1927 Cents	Feb. 16, 1926 Cents
Sheets, black, No. 24, P'gh	2.80	2.80	2.90	3.15
Sheets, black, No. 24, Chicago dist. mill	2.90	2.90	3.10	3.30
Sheets, galv., No. 24, P'gh	3.70	3.75	3.75	4.05
Sheets, galv., No. 24, Chicago dist. mill	3.85	3.85	3.95	4.25
Sheets, blue, 9 & 10, P'gh	2.20	2.20	2.25	2.50
Sheets, blue, 9 & 10, Chicago dist. mill	2.30	2.30	2.40	2.60
Wire nails, Pittsburgh	2.55	2.55	2.65	2.65
Wire nails, Chicago dist. mill	2.60	2.60	2.70	2.70
Plain wire, Pittsburgh	2.40	2.40	2.50	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.55	2.55
Barbed wire, galv., P'gh	3.25	3.25	3.35	3.35
Barbed wire, galv., Chicago dist. mill	3.30	3.30	3.40	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material. Per Gross Ton:				
Carwheels, Chicago	$15.00	$15.00	$15.50	$17.00
Carwheels, Philadelphia	16.00	16.00	16.50	17.50
Heavy melting steel, P'gh.	16.00	16.00	16.75	17.50
Heavy melting steel, Phila.	14.50	14.50	15.50	16.00
Heavy melting steel, Ch'go	13.00	13.00	13.25	13.75
No. 1 cast, Pittsburgh	15.75	15.75	16.00	17.00
No. 1 cast, Philadelphia	17.00	17.00	17.00	17.50
No. 1 cast, Ch'go (net ton)	16.50	16.50	16.50	17.00
No. 1 RR. wrot., Phila.	17.00	17.00	17.00	17.50
No. 1 RR. wrot., Ch'go (net)	11.75	11.75	12.75	12.75
Coke, Connellsville. Per Net Ton at Oven:				
Furnace coke, prompt	$3.50	$3.25	$3.50	$5.00
Foundry coke, prompt	4.25	4.25	4.50	6.00
Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	13.00	12.75	13.50	14.50
Electrolytic copper, refinery	12.75	12.30	13.12½	14.12½
Zinc, St. Louis	6.67½	6.55	6.52½	7.75
Zinc, New York	7.02½	6.90	6.87½	8.10
Lead, St. Louis	7.30	7.22½	7.45	9.00
Lead, New York	7.40	7.40	7.65	9.15
Tin (Straits), New York	68.75	69.50	66.50	64.25
Antimony (Asiatic), N. Y.	14.50	15.25	15.00	21.37½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Bookings Increase and Ingot Output Rises to 77 Per Cent—Coke Stronger

PITTSBURGH, Feb. 15.—Hesitancy on the part of the consumers of steel has not entirely disappeared but is less marked as the season of greater consumption approaches and the need of supplies becomes more pressing. The volume of business is plainly larger this week than it was last week, which, in turn, showed measurable improvement over the week before. It has taken price concessions to start business upward from its reaction over the last four months of last year, but there is at least partial compensation for the lower returns in the fact that ingot production in this and nearby districts has risen from a rate of 70 per cent, or a little less, to about 77 per cent of capacity, which must have brought some lowering of costs.

All products have not shared alike in the betterment in business. Sheets are still rather slow, and it is evident in view of continued price competition in wire products that the recent formal reduction of $2 per ton has not greatly increased mill obligations. Seldom has there been a greater demand for large-diameter pipe than there has been over the past few weeks, and it continues, as the past week has brought out one new inquiry for more than 400 miles of 20 and 22-in. sizes. Makers of the automobile steels are finding not only that specifications are steadily increasing, but that interest in supplies for March and April on the part of the motor car builders is really earnest.

Steel bars, both merchant and for further processing, are doing much better than they did last month in point of bookings and shipments. Plates feel the larger volume of railroad car orders and also the heavy ordering of large line pipe. Local business in structural steel is light, but local mills share in the building construction activity of other parts of the country.

Prices are no firmer than they have been, but at least have reached levels where even the manufacturers in greatest need of orders hesitate long about going lower. That wire nails are selling $1 a ton below the recently announced schedule is hardly evidence of fresh weakness, as they were selling at $2.50. base, per keg, Pittsburgh, when $2.55 was announced as the price. There are some distributers who usually have a preferential price.

The pig iron market has been showing some resistance to pressure for lower prices, a large inquiry for basic iron from eastern Ohio failing to bring out a lower price than $18, Valley furnace. Coke is growing stronger as a result of a loss of production, due to the inability of producers to come out whole on the current wage scales and the recent prices ruling for coke. There is a stronger demand for both coal and coke, but the supply of coal is still too heavy for demands, including those for stocking, and prices are even weaker than they have been. The conference of operators and miners' union representatives in Miami, Fla., this week is being watched with much attention, but the common expectation is that it will end in a disagreement and that the union mines will suspend on

April 1. There is much guessing as to the outcome of the impending struggle, but there is one thing that is certain and that is that consumers will be better stocked with coal than they were at the outset of the last strike in 1922, and unless non-union production is affected, there should be ample supplies of coal regardless of the duration of the strike in the union districts.

Pig Iron.—The market has not grown any more active, but at least it has shown some resistance to efforts to force lower prices. This is manifest in the test of the market by the inquiry of the American Steel Foundries for a round lot of basic iron for its Alliance, Ohio, plant, which although placed at less than the equivalent of $18, Valley furnace, failed to bring out a lower price than $18 from any of the Valley furnaces. Sales of Bessemer iron amounting to 1600 tons are noted at the recent price of $19, Valley furnace, and there has been no shading of $18.50, Valley furnace, for No. 2 foundry or malleable iron on such business as has developed in this market lately. No large lots of the latter grades are sought, but with coke high and more likely to be higher than lower in the near future, there is not much pressure to sell iron.

We quote f.o.b. Valley furnace, the freight for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$18.00
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	18.50
Low phosphorus copper free	28.00

Steel and Iron Bars.—The ordinary tonnage price of steel bars now is commonly 1.90c., base Pittsburgh, the one important producer in this district that was holding to 2c. having gone to the former price within the week. Bar business generally is better than it was last month, and on some of the popular sizes of screw stock bars there are some makers who are not able to promise delivery on new business more promptly than in two to three weeks. Iron bars are holding at recent prices and moving a little faster.

Structural Steel.—Fairly heavy demands are being made on local mills, but they originate more largely from outside than within the Pittsburgh district and no small part of the fabricating business that is coming to local shops also is from outside of the Pittsburgh district. Local shops have not been able to increase operations, which are approximately 60 per cent of capacity. Large structural shapes are bringing 1.90c., base Pittsburgh.

Plates.—There is fairly active operation of plate mills in this district, due to the appearance of orders against railroad cars placed with local builders and an unusually heavy demand for large-diameter line pipe, calling for plates as distinct from skelp. The ordinary tonnage price is 1.90c., base Pittsburgh, with $1 to $2 a ton less appearing on large lots.

Hot-Rolled Flats. — The market appears to be a shade steadier. Mills have fairly large bookings as a result of the recent price weakness and do not appear anxious for more. There continues to be some business in round lots embracing wide and narrow stock at the base price of the former, but on the ordinary tonnages the demarcation between wide and narrow strips is plainer, with makers quoting 2.20c. to 2.30c., base, on the latter and 2c. to 2.10c., base, on the former.

Cold-Rolled Strips.—Prices are no lower than they have been, but at the same time not much effort is noted in the direction of putting them higher. On actual sales, depending on the tonnage, the market is quotable from 2.80c. to 3.25c., base, Pittsburgh, but on most of the business that is passing the price is 3c., base. Automobile builders are ordering material out more freely and showing increased interest in supplies for March and April, in keeping with large production schedules for those months.

Bolts, Nuts and Rivets.—The market is showing marked firmness in bolts and nuts, but no more strength than recently on rivets. Discussion of the standardization of packages for bolts and nuts, which has been in progress for several weeks, is understood to have reached a stage where both manufacturers and jobbers are satisfied, and the matter will be considered at a meeting with the division of simplified practice, Department of Commerce, in Washington next month.

Warehouse Business.—Prices of galvanized sheets and of wire products out of local warehouses have been lowered $2 a ton, these changes being in keeping with recent mill price declines. Prices of other products are holding. Warehouse business has been only fair so far this year.

Ferroalloys.—A quickening of the steel works operations, notably in the Youngstown district, is reflected in freer specifications against contracts for the more commonly used ferroalloys. In January a considerable tonnage of spiegeleisen was not taken up by contract buyers, but this month the specifications are fully up to the expected quotas. This makes for a firm spot situation in this material, as spot offerings depend upon the amount that is not specified by those under contract. There has been no change in prices, which are given on page 529.

Semi-Finished Steel.—Sheet and strip makers dependent on outside producers for billets, slabs and sheet bars are specifying with a little more freedom this month than they did in January, in keeping with larger bookings and shipments of the finished products. Sheet bars are freely available at $34, Pittsburgh or Youngstown, and billets and slabs at $33 and $34, according to size, although observance of a size differential on large and small billets and slabs is not rigid. Makers of forging quality steel still are holding to $40, base. The open market price on wire rods is $43, base Pittsburgh or Cleveland, with the usual preferential price of $1 to $2 a ton less to large-lot buyers. Skelp is merely nominal at 1.90c.

Wire Products.—The recent downward revision in prices does not appear to have given the market much more stability than it had recently. With one large jobber here making a price of $2.57½, base, per keg on nails, it is believed there is a mill price of less than $2.55, while the reports from the East are that job-

THE IRON AGE Composite Prices

Finished Steel

Feb. 15, 1927, 2.374c. Per Lb.

One week ago	2.374c.
One month ago	2.439c.
One year ago	2.424c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.374c.,	Feb. 8
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Feb. 15, 1927, $18.96 Per Gross Ton

One week ago	$19.13
One month ago	19.39
One year ago	21.79
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.96,	Feb. 15
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
Del'd Cleveland	2.09c.
F.o.b. Cleveland, sizes up to 1-in. rounds,	1.90c. to 2.00c.
F.o.b. Birmingham	2.05c. to 2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c.

Rail Steel

F.o.b. mill	1.75c. to 1.80c.
F.o.b. Chicago	1.90c. to 2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.90c. to 3.00c.
Common iron, del'd Philadelphia	2.12c. to 2.22c.
Common iron, del'd New York	2.14c. to 2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.90c.
F.o.b. Chicago	2.00c. to 2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c. to 2.19c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh,	2.10c. to 2.30c.
All gages, 6 in. and wider, P'gh	2.00c. to 2.10c.
All gages, narrower than 6 in., Chicago,	2.44c. to 2.50c.
All gages, 6 in. and wider, Chicago,	2.34c. to 2.40c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.40c.
Bars, f.o.b. Chicago	2.40c.
Bars, Cleveland	2.45c.
Shafting, ground, f.o.b. mill	*2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	2.80c. to 3.05c.
Strips, f.o.b. Cleveland mills	2.85c. to 3.00c.
Strips, delivered Chicago	3.15c. to 3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.50 to $2.55
Galv'd nails, 1-in. and longer	4.55
Galv'd nails, shorter than 1-in.	4.80
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55
	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.25
Barbed wire, painted	3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	63.00
F.o.b. Birmingham	63.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10c. to 2.25c.
Nos. 9 and 10, f.o.b. Ohio mill	2.10c. to 2.30c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.30c. to 2.40c.
Nos. 9 and 10, del'd Philadelphia	2.47c. to 2.62c.
Nos. 9 and 10, f.o.b. Birmingham	2.50c. to 2.55c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.80c. to 2.90c.
No. 24, f.o.b. Ohio mill	2.80c. to 2.90c.
No. 24, f.o.b. Ch'go dist. mill	2.90c. to 3.00c.
No. 24, del'd Philadelphia	3.12c. to 3.22c.
No. 24, f.o.b. Birmingham	3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.80c. to 3.90c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.80c.
No. 24, f.o.b. Ohio mill	3.70c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill	3.85c. to 3.95c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	4.00c. to 4.05c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.10c. to 3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.15c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.00 to $3.15
2300	(3½% Nickel)	4.30 to 4.40
2500	(5% Nickel)	5.50
3100	(Nickel Chromium)	3.30 to 3.40
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.30 to 3.40
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.20 to 4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.20 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$34.00 to 33.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $3.00
Spikes, ½ in. and smaller	2.90 to 3.00
Spikes, boat and barge	3.30
Track bolts, all sizes	3.90 to 4.50
Tie plates, steel	2.20
Angle bars	2.70

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛	45	19½	⅛ to ⅜	+11	+39
¼ to ⅜	51	25½	½	23	2
½	56	42½	¾	28	13
¾	60	48½	1 to 1¼	30	18
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	1
2½ to 6	59	47½	2½	26	13
7 and 8	56	45½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	13
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	⅛ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	7
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	43½	2	23	1
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	3
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+13
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2½ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	46
1¼ to 1½ in.	52	3½ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2½ in.	31	4½, 5 and 6 in.	43
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	34	3½ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	53
3 in.	45	4½, 5 and 6 in.	45

Less carloads, 4 points less. Add $3 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.20%, base	55
Carbon, 0.20% to 0.40%, base	50

Plus differentials for lengths over 12 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

bers have named a resale price of $2.55, base Pittsburgh. If the buyer takes sufficient tonnage, the price of nails is $2.50, base Pittsburgh, with the quotation of $2.55 apparently applying only on single or mixed carloads. Mills in this area are better supplied with business than they were recently, but on a country-wide basis bookings have not increased sufficiently to lessen competition and recently announced prices still are subject to shading by $1 a ton.

Rails and Track Supplies.—The Boston & Maine Railroad has placed 1,300,000 tie plates with an Eastern mill but is yet to close on 11,000 kegs of spikes. The Nickel Plate has 250,000 (1500 tons) of tie plates to place. In a general way, track accessory business is not up to expectations based on the rail orders placed for 1927 delivery. Standard-section rails are moving steadily. Light-section rails sell only fairly well, but efforts by buyers to weaken prices have not succeeded.

Tubular Goods.—Makers of large outside-diameter pipe are well supplied with business as a result of recent line pipe orders, and seeing an engagement of large furnace capacity for the next two or three months, they are not quite so eager for orders in smaller sizes as they were recently. Large-diameter pipe does not move through the mills so rapidly as do the smaller sizes. More than 100 miles of line pipe, ranging from 6 in. to 16 in. in size, was placed in the past week, and it is believed that the gas line running from Amarillo, Tex., west to Denver, is nearing the closing stage. The Texas Co. recently put out an inquiry for 255 miles of 22-in. and 150 miles of 20-in. pipe, or approximately 125,000 tons. Seamless and welded oil country pipe are moving with more freedom, and the approach of spring is causing a stronger demand for standard pipe. Mill operations range from 75 to 80 per cent of capacity, with shipments running nearer to output than was true recently. Mechanical tubing is moving better this month than it did last, and there is a fairly good call for locomotive tubes, but ordinary boiler tubes are slow and competition for business is sharp.

Sheets.—Actual requirements in sheets appear to be increasing, and orders and specifications of leading producers in the past week are reported to be the largest of any week since last September. Prices are no stronger than they have been. Most consumers had plenty of opportunity to cover their requirements for the last quarter of last year before the September advances in prices occurred. Their purchases at that time exceeded their needs, and they have been able to extend the low prices by reason of the necessity for orders at most mills with the turn of the year. No lower prices than have recently prevailed are noted on black, blue annealed and automobile body sheets, but 3.65c., base Pittsburgh, on galvanized sheets has been more frequent. Two local makers of tin mill black plate are quoting 3.10c., base, and on stock for enameling are still shipping against contracts calling for 3.15c., base. Mill operations are a little heavier than they were a week ago, running from 70 to 75 per cent of capacity.

Tin Plate.—New business is light, as it usually is at this time of the year, but most producers are well supplied with contracts covering the first half of the year and are producing steadily against them. There is some anticipation of specifications, but as a rule specifications are sufficient to provide mill scheduling without drawing against future quotas.

Cold-Finished Steel Bars and Shafting.—The steady, if gradual, expansion of automobile production is helping business in cold-finished steel bars, and leading makers report this month's orders and shipments to be running 30 to 40 per cent ahead of the same period last month. Outside of a few very large consumers who were covered for this quarter of the year at 2.30c., all business carries 2.40c., base Pittsburgh.

Coke and Coal.—A stronger demand for coal and coke has found the supply of the former more than ample and lower prices have developed, but the large call for coke has come at a time when producers were curtailing and prices have gone up about 25c. for both furnace and foundry grades. A little furnace coke has been sold within the week at $3.25 to $3.35, but today there were no offerings at less than $3.50 per net ton at ovens and the tonnages available at that price were small. Producers have not found recent prices profitable at present wage scales and output has been rather commonly curtailed to contract requirements. Foundry coke has been helped to higher prices by some stocking demand based on a possible interruption to Connellsville production in the event of a strike by the union coal miners on April 1. Coal prices are off 10c. to 15c. per ton from recent levels, despite some good-sized purchases for stock.

Old Material.—It was hard to sell heavy melting steel in this market a week ago at more than $16; it is even more difficult this week, because dealers with short sales to cover are not eager for supplies, while consumers appear well covered for the next 60 to 90 days and are not interested, although it probably would mean some saving in costs to meet current requirements from current offerings. This kind of material is rather freely offered at $16 but has not sold under that figure, which finds some support among dealers with contracts calling for 50c. to $1 a ton more. The market is not quotable at more than $11 on machine shop turnings, and that price is based chiefly on purchases by dealers. The leading consumer of this grade in this district is offering only $10. Blast furnace grades are easy, and the market is slipping on heavy breakable cast scrap, which has not lately been salable at more than $14.75.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	$2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg	2.90
Cement coated nails, per keg	2.90

We quote for delivery to consumers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton		
Heavy melting steel		$16.00
Scrap rails		15.50
No. 1 cast, cupola size	$15.50 to	16.00
Compressed sheet steel		15.00
Bundled sheets, sides and ends		14.00
Railroad knuckles and couplers	18.00 to	18.50
Railroad coil and leaf springs	18.00 to	18.50
Low phosphorus blooms and billet ends	20.00 to	20.50
Low phosphorus mill plates	19.50 to	20.00
Low phosphorus, light grade	17.50 to	18.00
Low phosphorus punchings	18.00 to	18.50
Steel car axles	21.00 to	21.50
Cast iron wheels	16.00 to	16.50
Rolled steel wheels	18.00 to	18.50
Machine shop turnings		11.00
Short shoveling steel turnings	12.00 to	12.25
Sheet bar crops	17.50 to	18.00
Heavy steel axle turnings	14.50 to	15.00
Short mixed borings and turnings	12.00 to	12.25
Heavy breakable cast	14.25 to	14.75
Cast iron borings	12.00 to	12.25
No. 1 railroad wrought	12.00 to	12.50
No. 2 railroad wrought		16.00
Railroad or automobile malleable scrap	16.00 to	16.50

Bethlehem Brings Out 14-in. and 16-in. Beams

The Bethlehem Steel Co. has announced to the trade rolling schedules of 14-in. and 16-in. wide flange beams in three weights, these being sizes which are also to be produced by the Carnegie Steel Co. at its Homestead, Pa., plant. This gives five sizes of beams between 12-in. and 18-in. inclusive, where heretofore there were but three, 12-in., 15-in. and 18-in.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	34.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $44. Cleveland mill base, $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	9.50c. to 10c.
Iron ore, Swedish, average 66% iron	9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $13.50
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.35 to $3.50
Foundry, f.o.b. Connellsville prompt	4.25 to 4.75
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.50
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis	10.50

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.75 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.85 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.90 to 2.10
Steam slack, f.o.b. W. Pa. mines	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines	1.40 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon

Per Gross Ton Delivered

50%	$85.00
75%	145.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$26.50	10%	$22.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.08 to $1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$17.00 to $17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	42.50

Fire Clay

	Per 1000 f.o.b Works High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$38.00 to $40.00
Maryland	43.00 to 46.00	38.00 to 40.00
New Jersey	55.00 to 75.00	
Ohio	40.00 to 43.00	38.00 to 40.00
Kentucky	40.00 to 43.00	38.00 to 40.00
Illinois	40.00 to 43.00	36.00 to 38.00
Missouri	40.00 to 43.00	36.00 to 38.00
Ground fire clay, per ton	6.50 to 7.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	40.00
Birmingham	50.00
Silica clay, per ton	8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$45.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ⅝" x 4 in.,	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square,	4.00c. per lb. off list
Hot-pressed nuts, blank or tapped, hexagons,	4.40c. per lb. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
⅞ in. and smaller, U. S. S.	80, 10, 10 and 5
1 in. and larger, U. S. S.	75, 10, 10 and 5
Small sizes, S. A. E.	80, 10, 10, 10 and 5
S. A. E., ⅞ in. and larger	75, 10, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	U.S.S.		Per 100 Net S.A.E.	U.S.S.
¼-in.	$0.44	$0.44	⅞-in.	$2.35	$2.40
5/16-in.	0.515	0.515	1-in.	3.60	3.60
⅜-in.	0.62	0.66	1-in.	5.05	5.80
7/16-in.	0.79	0.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

	Base per 100 Lb.
F.o.b. Pittsburgh	$2.30 to $2.40
F.o.b. Chicago	2.60

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5 to 70 and 10
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws	60 and 10
Milled standard set screws, case hardened,	50 and 5
Milled headless set screws, cut thread	50
Upset hex. head cap screws, U.S.S. thread,	50, 10 and 10
Upset hex. cap screws, S.A.E. thread,	50, 10 and 10
Upset set screws	50, 10 and 5
Milled studs	70 and 5

Chicago

Steel Specifications Show 30 Per Cent Gain—Pig Iron Recedes 50c. a Ton

CHICAGO, Feb. 15.—This is the fifth consecutive week that both sales and specifications for finished steel have shown an increase. Although sales have not bulked so large as have specifications, nevertheless the increase is substantial and follows closely the advance in rate of shipment. Specifications in the first half of February were 30 per cent heavier than in the corresponding period of January, and the past week has been the largest, with one exception, since last March. Orders for steel are well diversified, car builders being the largest users at the moment, with tank builders, building construction, railroad structural work and automobiles next in the order named.

With the blowing in of the No. 3 stack at South Chicago Feb. 12, the Steel Corporation now has seven blast furnaces in at that plant, 10 at Gary and one at Joliet, or a total of 18 active out of 27. The Inland Steel Co. is operating with full blast furnace capacity, while the Wisconsin Steel Works is blowing three and the Youngstown Sheet & Tube Co., two, making a total of 28 active steel works stacks out of 36 in this district.

Orders for 1200 freight cars and fresh inquiry for a like number leave outstanding inquiries at 3600, the same as a week ago. Car builders report that 15,700 freight and 350 passenger cars were ordered in January, whereas contracts signed so far in February total 3000 freight and 157 passenger cars, the last figure including 127 coaches for the Long Island Railroad. That the Illinois Central will come in the market before spring now seems to be a remote possibility.

With the exception of sheets the finished steel market in the Chicago district appears to have a better tone. Prices cannot be said to be strong, but the market is more clearly definite, which seems to give greater confidence to buyer and seller alike. Several lines, which have been more or less dormant through the winter, are now giving some promise of activity. Among these are the barn equipment makers, who are ordering out some material, and the farm machinery industry, which is revising its schedules upward for March and April shipments of steel.

Ferroalloys.—The spiegeleisen market is tight, local distributers having little or no tonnage of the domestic material to offer. Nominally the market is $37 base Hazzard, Pa., and the freight rate to Chicago is $7.76. Stocks of English spiegeleisen at New Orleans are not of large proportions, but there seems to be a disposition to move them as rapidly as possible. Orders are being solicited at $35 to $37, seaboard, or $42.56 to $44.56, delivered. Specifications for ferrosilicon are in good volume, and a few carlot sales are reported at $87.50, delivered, Chicago, or $2.50 above the contract price for the first quarter.

We quote 80 per cent ferromanganese, $107.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $44.56, delivered Chicago.

Pig Iron.—The desire to book tonnage in a market which is characterized by a few sales of small individual tonnage has brought out lower prices for pig iron. At least two sellers in Chicago participated in a sale of 1100 tons of No. 2 iron to a user close to and north of Chicago. The price was $20, f.o.b. local furnace. At St. Paul 500 tons brought out a price of $20.50, Duluth, for No. 1 iron. The freight rate from Duluth to St. Paul is $1.39 and the rate from Chicago is $2.87. On the other hand several lots of No. 2 foundry, totaling close to 1000 tons each, are said to have been sold at $20.50, furnace. Some underselling can be attributed to distress tonnage, but the market is not active and the urge to enlarge bookings is also responsible for price concessions. Four hundred tons of charcoal iron has been taken by a user north of Chicago at the full delivered price of $27.04. A melter in Chicago has placed 200 tons of low phosphorus iron at $31.75, delivered. Reports that silvery has weakened cannot be verified either by the action of producers or by actual sales at reduced prices.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.00 to $20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	20.50 to 21.00
Malleable, not over 2.25 sil.	20.00 to 20.50
High phosphorus	20.00 to 20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	27.04
Southern No. 2 (all rail)	24.01
Southern No. 2 (barge and rail)	22.18
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.50
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Plates.—Orders for railroad equipment include 1200 freight cars and 200 underframes. The Union Refrigerator Transit Co. has placed 500 refrigerator cars and the North American Car Corporation has purchased 200 poultry cars. The Chicago & North Western has contracted with the Pressed Steel Car Co. for 500 70-ton hopper cars. Fresh inquiry is not altogether encouraging, the total of 1200 being composed of several small lots ranging from 200 to 500 each. All told, there are now 3600 freight cars, 42 passenger cars and 1335 sets of box car underframes and superstructures before the trade. The long expected inquiry from the Illinois Central is said to have been definitely postponed until spring. Specifications for plates from the car builders are in good volume, and fabricators of tanks are pressing for early delivery against recent contracts. The Chicago Bridge & Iron Works will build tanks, requiring 3000 tons of steel, for an oil refiner at Houston, Tex. Sales of plates, which reached fair proportions a week ago, are well maintained, and as a result deliveries are extending. Prices are holding at 2c. to 2.10c., Chicago.

The mill quotation on plates is 2c. to 2.10c. per lb. base, Chicago

Structural Material.—Fabricators in this territory have booked 4000 tons in the week. Outstanding awards are 2000 tons for a mill building at Kellogg, Idaho, and 850 tons for a manufacturing plant at Granite City, Ill. The addition to the Cook County Jail, requiring 3500 tons, may be closed this week, the recommendation by the general contractor having been passed on to the County Commission for approval. Shop capacity in this district, which is far in excess of the rate at which awards have been made during the winter months, is not more than 40 per cent engaged. Current bids are low, and with inquiry dragging, there is little promise that competition will be less severe in the immediate future.

The mill quotation on plain material is 2c. to 2.10c. per lb. base, Chicago.

Bars.—Sales of soft steel bars are well maintained, the total for the first half of February being fully 10 per cent heavier than for the same period in January. Specifications continue to grow under the influence of increased requirements of the automotive trade and the forging industry. The agricultural implement business is showing more life, and there are reports that heavier plant schedules are being arranged for March. Soft steel bars are steady at 2.10c. in Chicago for desirable business. In competitive territory 2c., Chicago, is the ruling price. A car builder has placed 800 tons of iron bars with a St. Louis mill. Current business in Chicago is light, and bar iron mills are operating on a hand-to-mouth basis. There is no evidence, however, that less than 2c., Chicago, can be done in the matter of price. Specifications for alloy steel bars are a trifle heavier, and production in this territory is considered normal for this time of the year. Shipping orders for hard steel bars are steady and are sustaining double-turn operation of the two Chicago Heights mills. Shipments of fence posts are dragging, and the demand for rail steel reinforcing bars is not growing. On the other hand, barn equipment makers have come into the market, and orders from the bed trade are increasing in volume. Stocks at mills are being enlarged in an-

ticipation of spring demand for fence posts and reinforcing bars.

The prices per lb. are: Mild steel bars, 2c. to 2.10c. base, Chicago; common bar iron, 2c. base, Chicago; rail steel bars, 1.90c. to 2c. base, Chicago.

Wire Products.—The recent announcement of a $2 a ton reduction on wire and nails is responsible in part for a more active market. Mill operations are being held at 60 per cent of capacity, and shipments in excess of that output are being drawn from stocks, which are well rounded out. The jobbing trade is of fair proportions from all parts of the country with the exception of the Northwest, but as spring approaches heavier orders from that section are expected. Specifications from the manufacturing trade are in larger volume.

Rails and Track Supplies.—Miscellaneous sales of standard-section rails total 7000 tons. Orders for light rails are of carlot proportions, with inquiry unusually small. Orders for track accessories include 25,000 kegs of spikes and bolts and several miscellaneous lots of angle bars and steel tie plates. Rail mill operations are steady at 85 per cent of capacity, while the production of track supplies is steadily increasing.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

Reinforcing Bars.—With close to 4000 tons on actual inquiry, there is disappointment throughout the trade because contracts are not being closed more rapidly. A fair number of small awards have been made, but orders for 100 tons or more are dragging. Buying, as compared with outstanding tonnage, is not progressing as rapidly as at this time a year ago. Billet steel bars out of Chicago warehouses are showing a fair degree of firmness at 2.30c. to 2.75c. Dealers are quoting rail steel reinforcing bars at 2.10c. to 2.55c., Chicago. Recent awards and fresh inquiry are shown on page 543.

Cast Iron Pipe.—Inquiry from large municipalities is slower, but small-tonnage buyers and public utility companies are actively in the market. Chicago prices for 6-in. and larger diameter pipe range from $43.70 to $45.70, the first price being named only for large tonnages of desirable sizes. The United States Cast Iron Pipe & Foundry Co. is low bidder at $44.45, delivered, for 11,000 tons at 24, 36, 42 and 48-in. pipe for Chicago. The freight rate from Birmingham to Chicago is $8.20, but since the delivered price includes a charge for distributing the pipe along streets where it will be laid, the base price cannot be computed from the figures at hand. It is reported, however, that the bid was made on the basis of $35.50, base Birmingham. Kenosha, Wis., has awarded 1000 tons of 6 to 16-in. pipe to the Lynchburg Foundry Co. Fresh inquiry includes 1400 tons of 6 to 20-in. pipe for Elkhart, Ind., 500 tons of 3 to 12-in. for Racine, Wis., and 125 tons for Piqua, Ohio.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., $47.70 to $49.20; 6-in. and over, $43.70 to $45.20; Class A and gas pipe, $4 extra.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 24 black sheets	3.05c. to 3.15c.
No. 10 blue annealed sheets	2.40c. to 2.45c.
No. 24 galvanized sheets	3.90c. to 4.00c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, squares, tapped or blank,	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank,	3.75c. off per lb.
No. 8 black annealed wire, per 100 lb.	$3.30
Common wire nails, base per keg	3.05
Cement coated nails, base per keg	3.05

Sheets.—The Chicago sheet market is weak. At the same time demand is good, new buying having been the largest in several months. As the week comes to a close, specifications show improvement, particularly for blue annealed and black sheets in the heavier gages. Orders are small and pressure for deliveries, which range from 10 days to four weeks depending upon the product, is insistent. The Inland Steel Co. is operating 23 out of 28 hot mills.

Chicago delivered prices from mill at 2.95c. to 3.05c. for No. 24 black; 2.35c. to 2.45c. for No. 10 blue annealed; 3.90c. to 4c. for No. 24 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Cold-Rolled Strip.—Prices of this commodity are steadier, and orders are growing in volume.

Bolts, Nuts and Rivets.—Specifications for bolts, nuts and rivets are in smaller volume, with the exception of those emanating from builders of motor cars. In fact, the current rate of orders this week is only slightly larger than during the early part of January, and this leads the trade to believe that total specifications for the first quarter will not be so large as for the final three months of last year. Spot buying is very light, but prices are holding.

Old Material.—Insofar as consumer sales are concerned the market is marking time. Users who last week were willing to take tonnages offered by dealers have gained the impression that prices have not yet reached bottom and will now take only such scrap as is necessary for their immediate requirements. Unsolicited inquiry is lacking, and brokers, being pressed by outcoming tonnage and hesitating to put it down in yards, are willing to make sales at prices below the level of a week ago. Fortunately for traders there are a number of good-sized contracts on which tonnage can be shipped. This situation provides an outlet for railroad shipments, but in almost all cases the prices paid by the brokers are less than those received by the railroads. It is now apparent that the railroad lists of the past two or three months were bid too high. Users are refusing offers of heavy melting steel at $13.50 per gross ton, delivered, and dealers are trading in this grade at $13.25. Railroad lists include 3000 tons advertised by the Santa Fe, 3000 tons by the Rock Island and 1100 tons by the Chicago & Alton.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

	Per Gross Ton	
Heavy melting steel	$13.00 to	$13.50
Frogs, switches and guards, cut apart, and miscellaneous rails	14.50 to	15.00
Shoveling steel	13.00 to	13.50
Hydraulic compressed sheets	11.50 to	12.00
Drop forge flashings	9.50 to	10.00
Forged cast and rolled steel carwheels	16.50 to	17.00
Railroad tires, charging box size	17.00 to	17.50
Railroad leaf springs, cut apart	17.00 to	17.50
Steel couplers and knuckles	16.00 to	16.50
Coil springs	16.50 to	17.00
Low phosphorus punchings	15.50 to	16.00
Axle turnings, foundry grade	13.50 to	14.00
Axle turnings, blast fur. grade	10.50 to	11.00
Relaying rails, 56 to 60 lb.	25.50 to	26.50
Relaying rails, 65 lb. and heavier	26.00 to	31.00
Rerolling rails	15.75 to	16.25
Steel rails, less than 3 ft.	16.50 to	17.00
Iron rails	13.50 to	14.00
Cast iron borings	10.00 to	10.50
Short shoveling turnings	10.00 to	10.50
Machine shop turnings	7.00 to	7.50
Railroad malleable	16.00 to	16.50
Agricultural malleable	14.75 to	15.25
Angle bars, steel	15.25 to	15.75
Cast iron carwheels	15.00 to	15.50
	Per Net Ton	
No. 1 machinery cast	16.50 to	17.00
No. 1 railroad cast	15.50 to	16.00
No. 1 agricultural cast	14.25 to	14.75
Stove plate	13.50 to	14.00
Grate bars	13.00 to	13.50
Brake shoes	13.00 to	13.50
Iron angle and splice bars	14.00 to	14.50
Iron arch bars and transoms	18.50 to	19.00
Iron car axles	22.00 to	22.50
Steel car axles	17.00 to	17.50
No. 1 railroad wrought	12.25 to	12.75
No 2 railroad wrought	11.75 to	12.25
No. 1 busheling	10.25 to	10.75
No. 2 busheling	7.00 to	7.50
Locomotive tires, smooth	16.50 to	17.00
Pipes and flues	8.50 to	9.00

New York

Pig Iron Situation Grows Tense—Steel Prices Not Yet Stabilized

NEW YORK, Feb. 15.—In the pig iron market competition has grown even more tense. Furnaces appear anxious to drive in further business, and they have succeeded in doing so, but at the expense of prices. Foundry iron is now rather commonly quoted at $17 to $17.50, base Buffalo, although occasional sales at higher prices are still reported. At $17, however, furnaces are more disposed to insist on the silicon differentials than was the case at higher base prices. Little eastern Pennsylvania iron is penetrating this district in view of the low delivered prices available from other producing centers, but quotations of as low as $20.50, base furnace, are reported. Sales by local brokers during the past week total 15,000 tons, or about the same amount sold in the previous week. The General Electric Co. is now in the market for a total of 4580 tons, having put out additional inquiries for Schenectady and Elmira, N. Y., Bayway, N. J., and Pittsfield and Lynn, Mass. The Thatcher Furnace Co., Newark, N. J., is inquiring for 1500 tons each of No. 2 plain and No. 2X foundry for second quarter. The Worthington Pump & Machinery Corporation has entered the market for 1100 tons for its Laidlaw Works, Elmwood Place, Ohio, and will soon issue additional inquiries for its other plants. In New England the H. B. Smith Co., Westfield, Mass., which has been in the market for 7000 to 8000 tons of No. 2 plain for second quarter, has closed for part of its requirements.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices, $1.39 to $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$22.39 to $23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.89 to 24.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.39 to 24.52
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	21.91 to 22.41
No. 2 Virginia fdy., sil. 1.75 to 2.25	26.54 to 27.04

Ferroalloys. — Sales of ferromanganese are still confined to carload and small lots of which a few have changed hands at regular prices. There is no large demand before the market. General demand for spiegeleisen is quite pronounced, there being considerable inquiry from consumers other than those who can specify on contract. Prices continue firm and unchanged.

Finished Steel.—With no marked improvement in the volume of steel purchases in this district, prices of a majority of products continue weak. For the first time in more than a year there has been a break in the plate price. On carload lots the mills continue to quote 1.90c., Pittsburgh, but on a fair-sized tonnage a large consumer received a concession of $2 a ton. Plate buyers are shopping around for low prices more aggressively than at any time since the present price of 1.90c. became effective. Structural shapes continue weak, with the ordinary run of business being taken at 1.80c. to 1.90c., Pittsburgh, but some of the larger fabricators are said to be getting lower than 1.80c. on attractive tonnages. Improvement in the volume of structural tonnage was maintained during the first half of February, and a progressive improvement is looked for in view of the fact that fully 100,000 tons in the New York district alone will soon come into the market for bids. The sheet market is not so unsettled, but prices are no higher, except that some of the extremely low quotations are less frequently made. The range for blue annealed sheets is now 2.15c. to 2.25c., with black sheets from 2.75c. to 2.85c. and galvanized sheets 3.70c. and 3.75c., Pittsburgh. Hot rolled strip seems to have settled at 1.90c. to 2c., Pittsburgh, the lower price applying usually on pickled stock on which there are fairly high extras. The low price of hot rolled strip has cut the plate mills out of some orders for 3/16-in. universal plates, with which strip can now compete successfully. Cold rolled strip steel ranges from 2.80c. to 3c., Pittsburgh or Cleveland, but tubing makers have received prices under 2.80c. Some of the wire mills are trying to apply the 2.55c. price on wire nails to jobbers' orders, with 2.60c. to other trade.

We quote mill shipments, New York delivery, as follows: Soft steel bars, 2.24c. per lb.; plates, 2.14c. to 2.24c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Reinforcing Bars.—Several small jobs have been placed in the last week, and although business is at a much better rate than was the case in January, the improvement has hardly met expectations. The long list of jobs pending has been increased by approximately 2000 tons in the last two weeks. The larger distributers in this territory seem to be holding to the mill price of 2c., Pittsburgh, which has come to apply almost entirely to lots of 100 tons or more. The price of 2.10c., Pittsburgh, on smaller lots has practically disappeared, and jobs of this sort are nearly always

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	5.75c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread	40, 10 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40, 10 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
½-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	4	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

supplied out of warehouse. Some shading of the Youngstown warehouse price of 2.50c., or 2.87½c., delivered New York, has been reported, but these concessions seem to be offered principally by distributers who do not ordinarily take business in this territory. Prices follow:

Mill prices on billet steel reinforcing bars are: 2c. per lb. base, Pittsburgh. Reinforcing bars out of New York warehouse are quoted at 3.15c. per lb. delivered at job, and out of Youngstown warehouse at 2.50c., Youngstown, or 2.87½c., delivered New York.

Cast Iron Pipe.—Private purchasing by gas and water companies is increasing in the number of orders rather than their size. Among recent awards is the reported purchase of about 2500 tons of water pipe for Hewlett, L. I., by the J. G. White Engineering Co. The Department of Purchase, New York, will open bids, Feb. 24, on about 10,000 tons of 6-in. to 16-in. water pipe and fittings. Prices are fairly firm, makers showing less inclination than a few weeks ago to go to low levels, except where foreign competition is anticipated. Most makers are comfortably booked with tonnage in the smaller sizes.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $48.60 to $50.60; 4-in. and 5-in., $53.60 to $55.60; 3-in., $63.60 to $65.60; with $5 additional for Class A and gas pipe.

Warehouse Business.—Current demand for sheets and tank plates is in good volume and prices are steady, following the recent downward revision on black and galvanized sheets. Purchasing of structural material from warehouse stocks has not yet developed into the usual spring buying movement. The market generally is inactive, but most warehouses report a fair number of small orders.

Coke.—Purchasing of foundry coke is active, with spot shipment coke bringing $4.50 to $5 per ton, Connellsville, and one operation in that district quoting $5.35 per ton. On contracts for delivery up to June, $5.25 per ton has been done, but with a wage clause included. Furnace is quoted at $3.50 to $3.75 per ton, Connellsville. Delivered prices of foundry coke are: To northern New Jersey, $8.53 to $9.53; New York or Brooklyn, $9.29 to $10.29; Newark or Jersey City, N. J., $8.41 to $9.41 per ton. By-product coke is quoted at $9.59 to $10.77 per net ton, delivered Newark or Jersey City, N. J.

Old Material.—Softness of prices continues, with brokers buying heavy melting steel at $14.50 to $15 per ton, delivered eastern Pennsylvania. For delivery to the leading eastern Pennsylvania consumer $14.50 per ton is now the maximum offered. This is also the offering price for delivery to Conshohocken, Pa., with brokers offering $15 per ton, delivered Coatesville or Steelton, Pa. Yard steel continues at $12 to $12.50 per ton, delivered, with shipments going forward to users at Harrisburg and Pottsville, Pa. Borings and turnings are unchanged at $11 per ton, delivered Bethlehem. Stove plate is quiet both on shipments to steel mills and to local foundries. Despite the low level of the present market, brokers see no prospect of an early change.

Buying prices per gross ton, New York, follow:

No. 1 heavy melting steel	$11.00 to $11.85
No. 2 heavy melting steel (yard)	8.50 to 8.75
Rails for rolling	12.00 to 12.50
Steel car axles	16.50 to 17.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	12.50 to 13.50
No. 1 yard wrought, long	11.50 to 12.50
Forge fire	8.50 to 9.00
Cast borings (steel mill)	8.25 to 8.75
Cast borings (chemical)	12.50 to 13.00
Machine shop turnings	7.75 to 8.25
Mixed borings and turnings	7.75 to 8.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	9.75
Stove plate (steel mill)	8.50 to 8.75
Stove plate (foundry)	10.50 to 10.75
Locomotive grate bars	9.50 to 10.00
Malleable cast (railroad)	14.00 to 14.25
Cast iron carwheels	11.00 to 11.50
No. 1 heavy breakable cast	11.75 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$15.00 to $15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to 14.00
No. 2 cast (radiator, cast boilers, etc.)	12.50 to 13.00

Cleveland

Steel Business from Automotive Industry Shows Further Gain

CLEVELAND, Feb. 15.—The volume of steel business in this territory, which has been slowly gaining for several weeks, showed a more marked increase during the past few days. This was due largely to the increased activity in the automotive industry, which is releasing liberal orders for early delivery. Automobile manufacturers are still avoiding extended commitments and, as a rule, are not placing orders for delivery beyond 30 days. This business is largely in sheets and strip steel, although the demand for both carbon steel and alloy steel bars has been stimulated. The increased demand from the automotive industry for finished steel is being reflected in the production of pig iron and semi-finished steel. The Corrigan, McKinney Steel Co. has blown in two blast furnaces in Cleveland, now operating its four stacks, and has added two additional open-hearth furnaces, now operating all of its 14 open-hearths. The Otis Steel Co. has started up its new open-hearth furnace, now operating all of its battery of five furnaces.

Metal-working plants outside of the automotive industry are getting busier and are buying steel somewhat more liberally than recently, but only for early needs. A fair volume of nail and wire business has followed the price reduction. In the structural field the outlook is not promising. Little new building work is being figured on, and not much is in prospect. While outside mills quote steel bars and structural material at 1.90c. to 2c., Pittsburgh, they are finding it increasingly difficult to get 2c. for small lots. The local mill price is from 1.90c. to 2c., Cleveland, but as low as 1.80c. is reported on attractive business.

Pig Iron.—Sales continue fairly heavy. Cleveland interests took orders for 37,000 tons during the past week, as compared with 40,000 tons during the previous week. With the increase in tonnage on the furnace books the market has a better tone, although this is not being reflected in any higher prices. However, there seems to be less disposition among some producers to go quite as low as a few weeks ago for business in the outlying territories. The Corrigan, McKinney Steel Co., Cleveland, blew in two blast furnaces during the week and is now operating all of its four River furnaces. The two stacks that have resumed went out of blast early in December. The American Steel Foundries has purchased 5000 tons of basic iron for its Alliance, Ohio, plant. This business went to an Ohio producer outside of the Valley district having a somewhat higher freight rate to the consuming point. Figured on the Valley basis the iron brought slightly under $18, Youngstown. The Cleveland price for foundry and malleable iron for outside shipment to competitive points remains at $17.50, furnace, but producers are trying to get $18 for nearby shipment. For local delivery the price is unchanged at $18.50 at furnace, and some buyers are attempting to secure concessions from that quotation. In the Valley district $18, furnace, has become the common price although some producers are still getting $18.50 for small lots. In Michigan the market seems fairly well established

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Reinforcing steel bars	2.75c. to 3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 24 black sheets	3.65c.
No. 10 blue annealed sheets	3.15c.
No. 24 galvanized sheets	4.50c.
Cold-rolled strip	*5.95c.
No. 9 annealed wire, per 100 lb.	$2.90
No. 9 galvanized wire, per 100 lb.	3.35
Common wire nails, base, per keg	2.90

*Net base, including boxing and cutting to length.

at $19, furnace. Sales during the week included 1000 tons of malleable iron to a Springfield, Ohio, consumer. A Cleveland buyer is inquiring for 2000 tons to 2500 tons of foundry iron, a Springfield melter for 2000 tons of foundry and malleable and a Dayton consumer for 1200 tons of foundry iron. There is a fair volume of activity in low phosphorus iron in small lots, and the market is holding to $28, furnace. A new differential of $1 a ton has been placed on Lake Superior charcoal iron running 1 per cent and over in manganese.

Quotations below are per gross ton and except on basic and low phosphorus iron, are delivered Cleveland, including a 50c. switching charge for local iron. Ohio silvery and Southern iron prices are based on a $3 freight rate from Jackson and $6 from Birmingham:

Basic, Valley furnace	$17.50 to $18.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	19.00
Southern fdy., sil. 1.75 to 2.25	24.00
Malleable	19.00
Ohio silvery, 8 per cent	31.50
Standard low phos., Valley furn.	28.00

Ferroalloys.—Some new demand has developed for spiegeleisen, but it is reported that the domestic supply is all sold for delivery up to July. Consequently some German spiegeleisen is being imported, which will be offered at slightly higher than the domestic, or at $38 to $38.50, Baltimore.

Alloy Steel.—The better demand from the automotive industry is resulting in some increase in plant operations. Locally a fair amount of business is being placed in small lots.

Semi-Finished Steel.—A heavy volume of specifications has come out the past week, and mills are filled up for the present. However, consumers are not ordering far ahead. A local producer continues to quote sheet bars, billets and slabs at a common price of $34, Cleveland, but some billet and slab business has been taken for shipment to the Pittsburgh territory at $35, delivered.

Sheets.—A very good volume of business is coming from the automotive industry, and trade from other sources shows a fair gain. Some of the mills have increased operations and have enough orders to keep them going at present capacity for two or three weeks or longer. These are taking a little firmer stand on prices, but others need tonnage and are naming low prices to get it. Black sheets still have a common price range of 2.80c. to 2.90c., mill, although a large order for Detroit shipment was taken at 2.65c., Pittsburgh. The usual price range on blue annealed sheets is 2.20c. to 2.30c., mill, but some business was taken during the week at as low as 2.05c., Pittsburgh. Galvanized sheets are moving well at a price range of 3.70c. to 3.75c., mill, with some business taken on a 3.65c., Pittsburgh base. Automobile body sheets are firm.

Strip Steel.—The demand for both hot and cold-rolled strip steel has become heavier, and mills have more business on their books than at any time since the slump in the automotive industry in November. However, prices have not strengthened. Most wide hot-rolled strip is still being taken at net delivered prices, and 2c., Pittsburgh, is regarded as the more common base, although some of the prices would figure back considerably lower. On narrow strip 2.20c. is fairly common. On cold-rolled strip the usual price range is 2.90c. to 3c., Cleveland. Fender stock is weak, having declined further to 4.35c., Cleveland, for desirable orders.

Reinforcing Bars.—The rail steel reinforcing market was tested during the week in the placing of 850 tons for the O'Neill department store, Akron. An unsuccessful bidder quoted 1.70c., mill, and it is understood the business went at about that price. Makers of new billet steel bars evidently made little effort to meet the competition. The range on smaller lots of rail steel bars is 1.75c. to 1.80c.

Warehouse Business.—Jobbers' sales show some gain except for sheets, which are only moderately active. Price reductions have been made on nails and wire, reflecting the reduction in mill prices. Other prices are holding firm.

Coke.—One producer is now offering a premium grade of Connellsville foundry coke at $5.25, ovens, for the second quarter subject to a wage clause, or the price at which contracts were taken for the current quarter. The range on standard Connellsville foundry coke for prompt shipment is unchanged at $4 to $5.35, ovens. Heating coke is slightly firmer, ranging from $3.25 to $3.50.

Old Material.—Dealers are still buying a small amount of heavy melting steel and blast furnace scrap against contracts with a Cleveland consumer, but these orders for the present are fairly well filled and the market does not show the strength of a week ago, prices on the two grades being about 25c. lower. Small-lot sales of borings and turnings have been made at $11.50, as compared with $11.75 a few days ago, although some had brought $12. Dealers had paid up to $15 for heavy melting steel, but $14.75 was the more common price during the week. There is no new demand from mills. Present prices are not bringing out much material.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel No. 1	$14.50 to $15.00
Heavy melting steel No. 2	14.00 to 14.50
Rails for rolling	16.25 to 16.50
Rails under 3 ft.	18.00 to 18.50
Low phosphorus billet, bloom and slab crops	18.00 to 18.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Low phosphorus forging crops	16.50 to 17.00
Cast iron borings	11.50 to 11.75
Machine shop turnings	9.00 to 9.25
Mixed borings and short turnings	11.50 to 11.75
Compressed sheet steel	13.75 to 14.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	14.50 to 14.75
Railroad malleable	16.00 to 16.50
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	12.50 to 13.00
No. 1 cast	16.00 to 16.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling	11.50 to 11.75
Drop forge flashings, 15 in. and under	14.00 to 14.50
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Pipes and flues	10.00 to 10.50

Philadelphia

Large Sales of Basic Pig Iron at Lower Prices—Steel Continues Weak

PHILADELPHIA, Feb. 15.—Sales of 25,000 tons or more of basic pig iron, some of it at $21, delivered, have brought the minimum price of that grade down at least 25c. a ton. From 5000 to 10,000 tons more is pending and probably will be bought this week at about the same level. Otherwise the pig iron market presents no new features, foundry iron remaining fairly firm at $21, base furnace, while low phosphorus iron is quoted at $25, furnace.

Weakness in prices of nearly all finished steel products continues to exert a deterrent effect on the placing of orders. Consumers are adhering to a policy of close buying for immediate requirements, and mills are operating at no appreciably higher rate. Eastern

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¼-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.90c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 24 black sheets	4.15c.
No. 10 blue annealed sheets	3.30c.
No. 24 galvanized sheets	5.10c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.
Tool steel	8.50c.

plate mills are concerned about reports of shading of $1 or $2 a ton on plates, but sales in this district during the week have generally been at 1.90c., Pittsburgh.

Pig Iron. — Two Eastern steel companies have bought large tonnages of basic pig iron in the past week, and another is negotiating for 5000 to 10,000 tons, which may be bought before the end of the week. One company placed orders for about 15,000 tons, and another bought 11,000 tons. The delivered prices ranged from $21 to $21.39. The lower figure is 25c. below what has recently been regarded as the minimum. Sales of foundry pig iron have totaled several thousand tons, mostly for second quarter, and prices have usually been $21, furnace, for the base grade, but slightly higher than this figure has obtained on some small orders. As soon as orders on its books are filled, the Robesonia furnace probably will go out of blast. The Brooke furnace will be rebuilt some time this year, but no definite date has been set, and one of the furnaces of the Alan Wood Iron & Steel Co. may soon be put out for relining, but it will be kept in operation as long as possible. Makers of low phosphorus pig iron in this district continue to quote $25, furnace. It is reported that English low phosphorus iron has again been offered in this market at $25, duty paid, Philadelphia.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic, delivered eastern Pa.	21.00 to 21.39
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
*Virginia No. 2 plain, 1.75 to 2.25 sil.	26.17 to 26.67
*Virginia No. 2X, 2.25 to 2.75 sil.	26.67 to 27.17

*The freight rate from Virginia furnaces to Philadelphia is $5.17 per gross ton.

Ferromanganese.—Buying of ferromanganese is at low ebb, most consumers now having covered their requirements for first half. Quotations continue at $100, seaboard, for domestic or imported alloy.

Billets.—Mills which roll billets for merchant sale are not a unit in meeting prices which recently have been noted on some transactions. Some mills which are willing to sell ordinary rerolling quality at $33, Pittsburgh, are not disposed to let this base price apply on billets of special analyses and on billets under 4 x 4 in.

Plates.—The Chesapeake & Ohio Railway has issued an inquiry for about 7500 tons of steel, about half of which is copper-bearing plates for 500 gondola cars it will have built. In addition to plates, there is a large tonnage of structural shapes and smaller lots of bars. Competition is becoming keener for plate orders and prices below 1.90c., Pittsburgh, have been reported to Eastern mills, though apparently there has been no occasion for the granting of concessions in or near Philadelphia. A shipbuilding company is asking for prices on 3600 tons of plates for an oil tanker, with the possibility that three ships may be built, involving a total of more than 10,000 tons of plates.

Bolts, Nuts and Rivets.—Makers of bolts, nuts and rivets will soon announce a new schedule of list prices, on which also a new set of discounts will apply. There will be a single discount on each item instead of the string of discounts which has usually been in effect. The new plan, it is pointed out, will be much simpler for both buyers and sellers. It is probable that the list and discounts will be announced about March 1 to take effect on orders placed for second quarter.

Structural Shapes.—On ordinary lots the current quotations on plain material are 1.80c. to 1.90c., Pittsburgh, with large fabricators obtaining prices below 1.80c. when the tonnage is unusually attractive. There is very little fabricated steel work pending in the Philadelphia district, and fabricators are still badly in need of orders, a condition which makes for low prices on fabricated steel contracts. The Bethlehem Steel Co. is now taking orders for 14-in. and 16-in. wide flange beams, new sizes for which rolling schedules have been announced.

Bars.—There has been no appreciable gain in the sales of steel bars. Demand for concrete reinforcing bars is very light, considering the approach of the spring building season. On carloads or more the usual quotation is 1.90c., Pittsburgh.

Sheets.—The sheet market has not recovered from its recent break. Fresh weakness has developed in galvanized sheets, which have been sold at 3.65c., Pittsburgh, with 3.75c. now the top. Black sheets range from 2.75c. to 2.90c., Pittsburgh, and blue annealed sheets are fairly well settled at 2.20c., with occasional sales at 2.15c.

Warehouse Business.—Local warehouses have reduced prices on sheets out of stock 20c. per 100 lb., the new quotations being 3.30c. for blue annealed, 4.15c. for black and 5.10c. for galvanized.

Imports.—Last week's imports included 1048 tons of steel blooms from France, 3694 tons of manganese ore from British West Africa and 508 tons of chrome ore from Portuguese Africa.

Old Material.—One or two steel companies will not pay above $14.50, delivered, for No. 1 heavy melting steel. Brokers and dealers are willing to sell at $15. Weakness continues in other grades. An unusual situation is that the low prices, instead of holding tonnage back from the market, seem to have the opposite effect, and offerings are ample for all demands. In fact, more is being pressed on the market than can readily be absorbed.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$14.50 to $15.00
Scrap T rails	14.00 to 14.50
No. 2 heavy melting steel	12.50 to 13.00
Steel rails for rolling	16.50 to 17.00
No. 1 low phos., heavy, 0.04 per cent and under	20.00
Couplers and knuckles	17.50
Rolled steel wheels	17.50
Cast iron carwheels	16.00 to 16.50
No. 1 railroad wrought	17.00 to 17.25
No. 1 forge fire	12.50 to 13.00
Bundled sheets (for steel works)	11.50 to 12.00
No. 1 blast furnace scrap	10.50 to 11.00
Machine shop turnings (for steel works)	11.50 to 12.00
Machine shop turnings (for rolling mill)	12.00 to 12.50
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mill)	12.50 to 13.00
Cast borings (for chemical plant)	15.00 to 16.50
No. 1 cast	17.00 to 17.50
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.50
Stove plate (for steel works)	12.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00
Shafting	18.50 to 19.00
Steel axles	21.00 to 22.00

Steel Corporation's Unfilled Orders Decreased in January

After increases for four months in succession, the unfilled orders of the United States Steel Corporation, at the end of January, showed a decrease. The total unfilled business on Jan. 31 amounted to 3,800,177 tons, a decrease of 160,792 tons from the 3,960,969 tons on the books as of Dec. 31. This decrease compares with an increase in December over November of 153,522 tons and with one of 123,786 tons in November over October. A year ago, the unfilled business was 4,882,739 tons. The following table gives the unfilled tonnage by months, beginning with January, 1925:

	1927	1926	1925
Jan. 31	3,800,177	4,882,739	5,037,323
Feb. 28	.....	4,616,822	5,284,771
March 31	.....	4,379,935	4,863,564
April 30	.....	3,867,976	4,446,568
May 31	.....	3,649,250	4,049,300
June 30	.....	3,478,642	3,710,458
July 31	.....	3,602,522	3,539,467
Aug. 31	.....	3,542,335	3,512,803
Sept. 30	.....	3,593,509	3,717,297
Oct. 31	.....	3,622,661	4,109,152
Nov. 30	.....	3,807,447	4,581,780
Dec. 31	.....	3,960,969	5,033,364

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

Boston

Pig Iron Still Active—Foundry Coke Reduced—More Pipe Inquiry

BOSTON, Feb. 15.—Buffalo pig iron prices appear somewhat firmer. Iron heretofore offered at $17 to $17.50 a ton on cars, furnace, is now more commonly commanding the silicon differentials and in some cases higher base prices. Sales in the past week approximated 10,000 tons, some for delivery outside of New England. A Bridgeport, Conn., foundry is in the market for 1500 tons of high silicon iron; a Worcester, Mass., foundry for 600 tons of mixed foundry grades for March, April, May and June delivery, and a Springfield, Mass., foundry for 300 to 500 tons of No. 1X. A Westfield, Mass., foundry may buy 7000 to 8000 tons of No. 2 plain iron this week, and possibly 10,000 to 12,000 tons, for second quarter shipment.

We quote delivered prices per gross ton to most New England points as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $6.91 to $8.77 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.65 to $25.15
East. Penn., sil. 2.25 to 2.75	25.15 to 25.65
Buffalo, sil. 1.75 to 2.25	21.91 to 22.91
Buffalo, sil. 2.25 to 2.75	22.41 to 23.41
Virginia, sil. 1.75 to 2.25	27.42
Virginia, sil. 2.25 to 2.75	27.92
Alabama, sil. 1.75 to 2.25	24.91 to 26.77
Alabama, sil. 2.25 to 2.75	25.41 to 27.27

Finished Material.—Indications are that February will be a good month with local steel mill representatives. Specifications against first quarter contracts are coming in quite well. New business is running slightly better than in January, but prices average a little lower. Plates, standard shapes and bars, heretofore 2c. per lb., base Pittsburgh, are now generally 1.90c. It is possible slightly better can be done on large tonnages.

Warehouse Business.—Most warehouses report a falling off in shipments this month. Stocks are well assorted but not heavy. Boston has not followed New York's reduction in sheet prices, but has reduced wire nails on direct mill shipments 10c. per keg to $2.55, base. Iron and steel prices are steady.

Cast Iron Pipe.—The pipe market is growing more active. In addition to 700 tons of 4, 6 and 8-in. pipe wanted by Springfield, Mass., bids for which close Feb. 17, Worcester, Mass., will take bids Feb. 15 on 1000 tons of 6-in. and larger pipe, and Lynn, Mass., on the same day, will receive figures on 300 tons of 6 and 8-in. pipe. Boston, it is expected, will award 3000 tons this week. Somerset, Mass., has closed bids on 3000 tons for a water system but has made no award. B. Nicoll & Co., representing foreign pipe makers, were the low bidders, and the United States Cast Iron Pipe & Foundry Co. submitted the lowest bid on American pipe. Numerous municipalities are sounding out the market for 1927 requirements, with indications of closing this or next month. Stone & Webster, Inc., is reported to have closed on the remainder of its 1927 gas pipe requirements. The market on small domestic pipe remains firm, and on large, weak. Prices quoted openly are: 4-in., $58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $53.10 to $54.10; larger pipe, $52.10 to $53.10. A $5 differential is asked on Class A and gas pipe.

Coke.—The movement of by-product foundry coke from New England ovens to consuming points has not increased noticeably, a reduction of 50c. a ton to $12.50, delivered, within a $3.10 freight rate zone, failing to stimulate specifications against contracts. The demand for domestic fuel is beginning to fall off, although it is still of sizable proportions.

Old Material.—Brokers complain that never was it so difficult to do business as it is today. New specifications laid down by steel mills, particularly on turnings, are too rigid to be practical, according to common report here. Mills are making frequent rejections on the material shipped from New England, and price adjustments in such instances mean heavy losses to shippers. Owners of material are reluctant to sell at going prices. Under these conditions the market is quiet. While the average price offered on heavy melting steel is $10 to $10.50 a ton, on cars, some firms will not give more than $9.60. For steel turnings, $7 a ton seems to be the average top price, but $7.10 has been done recently. One firm has raised its bid on chemical borings from $10 a ton to $10.60, yet $10.50 is the best most brokers can do. Cotton ties, in 30-in. bundles, have changed hands at $8.10. Otherwise there seems to be little difference between prices this week and last week. The General Electric Co., West Lynn, Mass., has closed bids on 16 cars of miscellaneous, mostly blast furnace, material, for which low prices were bid in a majority of instances.

The following prices are for gross-ton lots, delivered at consuming points:

Textile cast	$18.00 to $18.50
No. 1 machinery cast	17.00 to 17.50
No. 2 machinery cast	15.50 to 16.00
Stove plate	13.00 to 13.25
Railroad malleable	16.50 to 17.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.00 to $10.50
No. 1 railroad wrought	12.00 to 12.25
No. 1 yard wrought	11.00 to 11.25
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.50 to 9.00
Machine shop turnings	6.50 to 7.00
Cast iron borings, chemical	10.00 to 10.50
Cast iron borings, rolling mill	7.50 to 8.00
Blast furnace borings and turnings	6.00 to 6.50
Forged scrap	7.50 to 8.00
Bundled skeleton, long	7.60 to 8.00
Forged flashings	8.00 to 8.50
Shafting	15.00 to 15.50
Street car axles	15.50 to 16.00
Rails for rerolling	11.00 to 11.50
Scrap rails	10.00 to 10.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Plates	3.365c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Cincinnati

Southern Ohio Pig Iron Declines $1—Foundries Buy Coke for Stocking

CINCINNATI, Feb. 15.—A reduction of $1 a ton in the price of southern Ohio foundry iron features the pig iron market. In an endeavor to meet successfully the competition of central and northern Ohio furnaces at least one producer in the Ironton district quoted $19, base furnace, on a 1000-ton inquiry from Springfield, Ohio, but that price was not low enough to secure the order. While $19 is not acknowledged to be the prevailing schedule, that figure is set by the furnace on desirable tonnage. Another Ironton seller is refusing to accept $19, base Ironton, if shipment must be made by rail, but will take orders at a delivered price that figures back on a rail basis to $19 at the furnace, provided that delivery can be made by water or by a combination of rail and water. In that way more than $19 is realized by the producer. Lake Erie interests continue to sell in this territory at $17.50 to $18, base furnace. Southern iron is firm at $18, base Birmingham, but sales have been meager. Purchases of Jackson County silvery iron have been limited to single carloads for delivery this quarter. A producer in the Ironton district is reported to be piling iron, and unless

its volume of business increases in the near future its one active stack will be blown out. Malleable iron is being sold at $19, base furnace, in southern Ohio, but competitive conditions farther north in the State have brought out lower quotations. The Andrews Steel Co. is in the market for 100 to 500 tons of Bessemer iron, and the Worthington Pump & Machinery Corporation is inquiring for about 1100 tons of foundry iron for its local plant.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$21.69
Alabama fdy., sil. 2.25 to 2.75	22.19
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25	20.89
So. Ohio malleable	$20.64 to 21.89

Finished Material.—A decline in specifications and orders for bars and structural steel has been offset by the development of a more stabilized condition in the sheet market, and the outlook is more promising than a week ago. Buying of sheets by automobile manufacturers has been a prominent factor in putting an end to the downward movement of prices. Electrical sheets have been only moderately active, but specialty grades of blue annealed and galvanized have shown strength. Black sheets range from 2.80c. to 2.85c., base Pittsburgh, and blue annealed are bringing from 2.15c. to 2.20c., base Pittsburgh. Galvanized sheets are in fairly good demand at 3.75c., base Pittsburgh. Sheet mills in this territory are operating at the highest rate in weeks, with schedules calling for approximately 90 per cent of capacity. The recent decrease of $2 a ton in bars and structural shapes has failed to stimulate sales. Fabricators in this district are buying only small lots of material for replacement. In fact, the first six weeks of this year have been unusually quiet so far as the awarding of structural steel contracts is concerned. Tank plates continue firm at 1.90c., base Pittsburgh. Common wire nails now are on a basis of $2.55 per keg, base Pittsburgh, or $2.60, base Ironton. The latter price, plus a 14c. barge rate to this city, gives a delivered price in Cincinnati of $2.74. Plain wire is being sold at $2.40 per 100 lb., base Ironton or Pittsburgh.

Reinforcing Bars.—With no sizable projects before the trade, producers are competing keenly on numerous small jobs. New billet bars are being offered at 1.90c., base Pittsburgh, a decrease of $2 a ton. Rail steel bars are bringing from 1.70c. to 1.80c., base mill.

Warehouse Business.—An increased demand for bars and structural steel has had a stimulating effect upon sales. Nails also are showing greater activity. The recent downward revision in the prices of bars and structural shapes is not expected to have any immediate effect upon quotations of those products for delivery from local warehouses.

Coke.—With the apparent intention of stocking against the possibility of a coal strike April 1, foundry coke consumers have purchased a considerable amount of beehive foundry coke in the past 10 days. Sales of New River foundry grades at $7.50 per net ton, f.o.b. ovens, have been liberal in volume, and a producer in that district has fired additional ovens to care for the growing demand. Wise County foundry coke is bringing $5 to $5.50, ovens, with furnace grades selling at $4.25 to $4.75. Specifications for by-product foundry coke have been brisk. A local soap company is expected to buy from 500 to 1000 tons of beehive furnace coke.

Based on freight rates of $2.14 from Ashland, Ky., and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Wise County foundry, $7.59 to $8.09; New River foundry, $10.09 to $10.59; by-product foundry, $9.64 to $10.14.

Old Material.—Increased operations of steel plants have been an encouraging development in the past week. While consumption of old material has not improved appreciably, shipments on contracts have been going forward at a fairly satisfactory rate. Prices are firm and unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton

Heavy melting steel	$12.50 to $13.00
Scrap rails for melting	12.50 to 13.00
Short rails	17.50 to 18.00
Relaying rails	26.50 to 27.00
Rails for rolling	14.00 to 14.50
Old carwheels	12.00 to 12.50
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	14.50 to 15.00
Agricultural malleable	13.50 to 14.00
Loose sheet clippings	9.00 to 9.50
Champion bundled sheets	9.50 to 10.00

Per Net Ton

Cast iron borings	8.00 to 8.50
Machine shop turnings	7.50 to 8.00
No. 1 machinery cast	16.00 to 17.00
No. 1 railroad cast	13.00 to 13.50
Iron axles	19.50 to 20.00
No. 1 railroad wrought	9.00 to 9.50
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Mixed busheling	6.00 to 6.50
Burnt cast	7.00 to 7.50
Stove plate	9.00 to 9.50
Brake shoes	9.50 to 10.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 24 black sheets	4.05c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	4.90c.
Structural rivets	3.75c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100-lb. keg	3.15
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Birmingham

Pig Iron Output Increases—Pipe Shop Operations Gain

BIRMINGHAM, Feb. 15.—Demand for pig iron is less brisk, although still in fair volume. Specifications from the larger consumers, however, are increasing and a reduction of surplus stocks on furnace yards is looked for at the close of the month. Prices are firm at $18 per ton, Birmingham, for No. 2 foundry, with small lots commanding a $1 premium. With the recent blowing in of a furnace on foundry iron, 11 stacks each are on foundry and basic, while one is on special iron. Basic iron output still exceeds the production of foundry iron because the larger furnaces are on basic. No sales for third quarter delivery have been reported, but there continues to be buying for second quarter. Two blast furnaces are ready to go in, but indications are that it will be March 15 or April 1 before they are put into operation. The output of Alabama blast furnaces for February, a short month, promises to approximate that of January.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$18.00
No. 1 foundry, 2.25 to 2.75 sil.	18.50
Basic	18.00
Charcoal, warm blast	29.00

Rolled Steel.—Most of the open-hearth furnaces and the majority of the mills in this district are in operation. The requirements in those products for which there is a strong demand, such as rails, railroad accessories, plates, wire and nails, are being met instead of keeping all mill departments active. There is a steady movement of steel by barge down the Warrior River, with prospects of the shipments being increased materially. The Tennessee Coal, Iron & Railroad Co. is reported to be building sea-going barges in Mobile to be used for shipments to Texas and other Gulf Coast

points. The car works at Fairfield, Ala., are busy and are consuming much steel.

Cast Iron Pipe.—Additional business in pressure pipe has been booked and production is being increased. Shipments are also heavier. Prices have been weak, lower than $36 to $37, Birmingham, on 6-in. and larger pipe, but in the last few days there has been recovery. Production will shortly be at the maximum. Centrifugal pipe shops are working on double turn, and additions at the McWane plant are being brought into service.

Coke.—Warm weather has had an adverse effect on demand in this territory, but specifications against contracts are still sustaining operations at all the by-product works. Prices are firm at $5.50, Birmingham, on foundry coke, with $6 asked on small lots and orders for immediate shipment. Work on additional coke capacity is being pushed, and before the end of the year a large increase in production will be available.

Old Material.—Heavy melting steel has declined $1 a ton to $12 on heavy sales. Other grades of scrap are weak.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.00
Railroad wrought	11.00 to 12.00
Steel axles	17.00 to 18.00
Iron axles	17.00 to 18.00
Steel rails	13.00 to 14.00
No. 1 cast	16.00 to 17.00
Tramcar wheels	16.50 to 17.50
Carwheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Rails for rolling	15.00 to 16.00

St. Louis

Pig Iron Buying Is Cautious—Old Material Prices Are Weak

ST. LOUIS, Feb. 15.—While melters in this district seem satisfied that pig iron prices are low enough, they are buying only enough material to take care of their current requirements. Sales during the week amounted to only about 3000 tons of foundry grades for shipment during first quarter and in some instances into April and May. Additional buying is expected soon by foundry interests catering to the railroads. Prices are unchanged, but there are such strengthening factors as the expected coal strike and the blowing out of another merchant furnace in Chicago. The implement business is reported to be suffering, with several plants operating only part-time.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$22.66
Northern malleable, sil. 1.75 to 2.25	22.66
Basic	22.66
Southern fdy., sil. 1.75 to 2.25	$22.42 to 23.42
Granite City iron, sil. 1.75 to 2.25	21.81 to 22.31

Finished Iron and Steel.—The market for plates and shapes is somewhat more active this week, and it is believed that prices at 2c., Chicago, are about as low as they will go. District fabricators on both sides of the river are disturbed because an Eastern mill obtained the contract for 800 tons of structural steel for the Commonwealth Steel Co., Granite City, through a price concession. It is reported that the Wabash will buy additional equipment, but otherwise little business from the railroads is in sight. Warehouse trade is dull. Bad weather has caused a temporary curtailment of activities in the oil fields.

Coke.—Coke is reported to be moving in fair volume to industries, although domestic sizes are dragging, with little hope for a revival in demand unless there is a coal strike.

Old Material.—The market is weak. While dealers have made only a few price reductions, consumers in the district will not buy at any price, giving a lack of business as the reason. Rails for rolling, frogs and switches, iron axles and bundled sheets are off 50c. a ton. Railroad lists include: Southern, 7700 tons; Chesapeake & Ohio, 9140 tons; Wabash, 2075 tons; Texas & Pacific, 2040 tons; Gulf Coast Lines, 1235 tons; Nickel Plate, 800 tons, and Ann Arbor, 185 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Rails for rolling	$15.00 to $15.50
Rails for rolling	15.50 to 16.00
Steel rails less than 3 ft.	16.00 to 16.50
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00
Cast iron carwheels	14.50 to 15.00
Heavy melting steel	12.75 to 13.25
Heavy shoveling steel	12.75 to 13.25
Frogs, switches and guards cut apart	14.00 to 14.50
Railroad springs	15.50 to 16.00
Heavy axle and tire turnings	10.25 to 10.75
No. 1 locomotive tires	16.75 to 17.25
Per Net Ton	
Steel angle bars	12.50 to 13.00
Steel car axles	17.25 to 17.75
Iron car axles	20.50 to 21.00
Wrought iron bars and transoms	18.00 to 18.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	11.50 to 12.00
Cast iron borings	9.00 to 9.25
No. 1 busheling	10.00 to 10.50
No. 1 railroad cast	14.25 to 14.75
No. 1 machinery cast	16.00 to 16.50
Railroad malleable	12.50 to 13.00
Machine shop turnings	6.25 to 6.75
Bundled sheets	7.50 to 8.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, mild steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 24 black sheets	4.45c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	5.25c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.65c.
Boiler rivets	3.85c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47½
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

Buffalo

Pig Iron Inquiry Tapers—Mill Operations Show Further Gain

BUFFALO, Feb. 15.—While a considerable tonnage of pig iron has been quietly placed during the week, it is probable that the wave of buying has passed its peak. Few sizable inquiries are out. The General Electric Co. has increased its inquiry to a total of 4600 tons for various plants. Altogether, pending business, including scattered lots, aggregates about 10,000 tons. The practice of waiving differentials on silicon continues to some extent, though the full scale has been obtained on considerable of the tonnage.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.50 to $18.75
No. 2X foundry, sil. 2.25 to 2.75	18.00 to 19.25
No. 1X foundry, sil. 2.75 to 3.25	18.00 to 20.25
Malleable, sil. up to 2.25	17.50 to 18.75
Basic	17.50 to 18.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Inquiry for bars is fair, with prices still at 2.165c., Buffalo. Not much sheet tonnage is coming out. On No. 24 gage black, 2.80c. to 2.85c., Pittsburgh, has been quoted, and a good inquiry might bring out a still lower figure. Cold-rolled strip steel is being used in many instances in place of full-finished sheets. Business in bolts and nuts is fairly good, as many consumers are coming into the market to get covered before the new list prices are issued. Mill operations have increased at the Donner Steel Co. works and at the Lackawanna plant. The Donner company has six open-hearth furnaces active out of its 10, and the Lackawanna works has 18 going out of 24. Bids are being taken for the general contract for a

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 24 black sheets	4.30c.
No. 10 blue annealed sheets	3.80c.
No. 24 galvanized sheets	5.15c.
Common wire nails, base per keg	$3.90
Black wire, base per 100 lb	3.90

$1,000,000 biscuit factory, which will require structural steel, and plans will be out in March for a 10-story office building, requiring principally reinforcing bars. A school in Rochester, N. Y., will call for 500 to 600 tons of reinforcing bars.

Old Material.—The market is quiet, with little new buying during the past week. One of the largest consumers has sufficient stock on hand to last until May and will not come into the market again, it is expected, until April. Prices vary considerably on heavy melting steel. For instance, one mill has declined to accept any of this material offered at $15, though a dealer is said to have paid $15.50 last week for a considerable tonnage, and one of the railroads recently obtained better than $16, Buffalo, for heavy melting steel for delivery to a local plant. Mill operations are improving, and it is expected that one of the larger mills will soon release shipping orders. This is expected to stiffen the market. There has been some business in No. 1 machinery cast at $16.50 to $16.75, and a few sales of malleable at about $17.50.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$14.50 to $15.00
Selected No. 1 heavy melting steel	16.00 to 16.50
Low phosphorus	17.50 to 18.00
No. 1 railroad wrought	13.00 to 13.50
Carwheels	16.00 to 16.50
Machine shop turnings	9.00 to 9.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	13.00 to 13.50
No. 1 busheling	15.00 to 15.50
Stove plate	14.50 to 14.75
Grate bars	12.00 to 13.00
Hand bundled sheets	10.50 to 11.50
Hydraulic compressed sheets	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.00 to 13.50

Toronto

Mill and Foundry Operations Increase —Heavier Railroad Buying

TORONTO, ONT., Feb. 15.—The iron and steel industry of Canada has shown steady improvement since the first of the year. Toward the middle of January steel mills, foundries and other companies producing iron and steel products had returned to the rate of operations that was in force before the Christmas holiday season set in. In general, the industry is now operating at a 20 per cent higher rate than at this season a year ago. Whereas foundry operations averaged between 40 and 50 per cent early in 1926, they now average between 60 and 70 per cent of capacity. The average of steel mills is between 80 and 100 per cent.

There is need for considerable new equipment for Canadian roads, and it now appears that orders that have been withheld for some time are about to be released. The Canadian National Railways propose to spend approximately $20,000,000 this year on rails and general equipment. Within the past few days it has awarded contracts for upward of $2,000,000 worth of rolling stock. Large rail orders are expected from both the Canadian National and Canadian Pacific lines. Automobile manufacturers are also showing more interest in the market and have put out inquiries for large tonnages of sheets and other material.

According to programs recently announced the building trades will account for a big movement in iron and steel, especially in structural steel and reinforcing bars. In Toronto alone three large hotels are projected for the present year, and prospective demand for structural steel is estimated at upward of 15,000 tons.

The Algoma Steel Corporation, Sault Ste. Marie, Ont., will resume operations at its rail mill on double shift on March 7, when work will be started on an order for the Michigan Central and the Canadian National railroads. The open-hearth furnaces and an additional blast furnace will be put in operation about March 5. The British Empire Steel Corporation, Sydney, N. S., is operating at about 75 per cent in all departments. The Steel Co. of Canada, Ltd., Hamilton, Ont., is operating practically at capacity and is said to have sufficient orders on hand to keep the works going at present rate for several months. There are now five active blast furnaces blowing in Canada out of a total of 15, as follows: British Empire Steel Corporation, two; Steel Co. of Canada, Ltd., two; Algoma Steel Corporation, one.

Pig Iron.—While there has been a steady demand for pig iron in this market since the first of the year, interest on the part of melters has fallen off during the last few days. This is due chiefly to the fact that the majority of melters have covered for first quarter and in many cases do not appear anxious to place second quarter contracts at the present time. A softening in prices featured the market during the week, with a reduction of $1 per ton effective in the Toronto market and $1.20 per ton in the Montreal district. This reduction was due almost entirely to the weakening of prices that has recently featured markets across the international boundary. At Toronto, pig iron prices are as follows: No. 1 foundry (2.25 to 2.75 per cent silicon) and malleable, $24.80 per gross ton; No. 2 foundry (1.75 to 2.25 per cent silicon), $24.30, Toronto. Prevailing Montreal prices are: No. 1 foundry and malleable, $27; No. 2 foundry, $26.50.

Warehouse Business.—The iron and steel warehouse markets of Toronto and Montreal continue active. Warehouse prices, with few exceptions, have remained firm and unchanged for several months.

Warehouse Prices, f.o.b. Toronto

	Base per Lb.
Plates, ¼ in.	3.35c.
Plates, ¼ in.	3.50c.
Small shapes	3.65c.
Channels, under 3 in.	3.65c.
Structural shapes, 3 in. and up	3.40c.
Mild steel bars, ¼ in.	3.65c.
Mild steel bars, ¼ in. and up	3.40c.
Reinforcing bars	3.40c.
Black sheets (No. 24 gage)	4.60c.
Galvanized sheets, (No. 24 gage)	5.60c.
Blue annealed sheets (No. 10 gage)	3.75c.
Bands	3.65c.
Spring steel	9.00c.
Horse shoe iron	4.35c.
Tire steel	4.00c.
Sleighshoe steel	4.30c.
Cold-drawn steel	4.50c. to 5.50c.

Old Material.—Sales in both the Toronto and Montreal districts have been in small volume during the past week, with current business confined almost entirely to small tonnages for spot delivery. Consumers holding contracts, however, are accepting deliveries on schedule. Mills in the Hamilton, Ont., district, which are using large tonnages of heavy melting steel and turnings, are furnishing the bulk of the Toronto business. Foundries throughout Ontario are buying conservatively, despite the fact that the melt is greater than that of a year ago. Quotations remain firm.

	Toronto	Montreal
Per Gross Ton		
Steel turnings	$8.50	$8.00
Machine shop turnings	8.50	7.50
Wrought pipe	6.00	6.00
Rails	11.00	10.00
No. 1 wrought	11.00	14.00
Heavy melting steel	11.00	9.50
Steel axles	16.00	17.00
Axles, wrought iron	18.00	19.00
Boiler plate	10.00	8.50
Heavy axle turnings	9.00	8.50
Cast borings	8.50	7.50
Per Net Ton		
Standard carwheels	15.00	16.00
Malleable scrap	14.00	14.00
Stove plate	10.00	13.00
No. 1 machinery cast	16.00	18.00

A new type of induction motor which, with its control, is even simpler to operate than the ordinary squirrel cage motor and compensator, is announced by the General Electric Co. The line bears the type designation FT and ranges in ratings from 7½ to 50 hp.

San Francisco

Good Volume of Lettings in Structural Steel, Cast Pipe and Reinforcing

SAN FRANCISCO, Feb. 15 (*By Wire*).—Buying during the past week has been fairly heavy, and fresh inquiries have been numerous in nearly all departments of the market. Fabricated lettings call for over 7200 tons of steel, cast iron pipe awards call for nearly 5000 tons and concrete bar contracts will take nearly 2000 tons, which will be furnished by local jobbers.

In Long Beach, Cal., a referendum will be held March 9 on a bond issue of $1,250,000 for proposed extensions to the municipal gas system. Of this amount it is planned to use $750,000 for a gas holder with a capacity of 10,000,000 cu. ft.

Pig Iron.—There has been little movement of pig iron recently. Sales are confined to small lots. Prices are unchanged.

	Per Gross Ton
*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings total 5590 tons; fresh inquiries call for 6200 tons. Mill quotations are firm at 2.35c., c.i.f. Coast ports. The outstanding shape letting of the week, 1500 tons for buildings for the Bunker Hill Smelting & Refining Co., Kellogg, Idaho, was taken by the Minneapolis Steel & Machinery Co. Other lettings, as well as new inquiries, are listed elsewhere.

Plates.—Spokane, Wash., has awarded 1200 tons to the Steel Tank & Pipe Co. of Oregon and 200 tons to the Beale Tank & Pipe Co. for the construction of a municipal pipe line. Los Angeles has placed 275 tons for a pipe line with the Western Pipe & Steel Co. The Feather River Power Co., San Francisco, will take bids Feb. 21 on 1800 tons for a pipe line. Eastern mills quote plates at 2.30c., c.i.f. Coast ports, but 2.25c. is considered possible on desirable tonnages.

Bars.—An unnamed San Francisco jobber has taken 327 tons for improvement work on Golden Gate Heights; Badt-Falk Co. took 300 tons for a building for the Daily News Publishing Co., and Gunn, Carle & Co. took 250 tons for a factory at Tenth and Bryant Streets. In San Francisco 150 tons for a hospital and in Sacramento 165 tons for the County hospital were taken by a local jobber. Prices are unchanged.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars and small angles	3.00c.
Small angles, ⅞-in. and over	3.00c.
Small angles, under ⅞-in.	3.40c.
Small channels and tees, ¾-in. to 2¾-in.	3.60c.
Spring steel, ¼-in. and thicker	5.00c.
No. 24 black sheets	4.70c.
No. 28 black sheets	5.15c.
No. 10 blue annealed sheets	3.75c.
No. 24 galvanized sheets	5.25c.
No. 28 galvanized sheets	6.15c.
Common wire nails, base per keg	$3.75
Cement coated nails, 100-lb. keg	3.75

Cast Iron Pipe.—The East Bay Water Co., Oakland, Cal., has placed 3400 tons with an unnamed producer. B. Nicoll & Co. have taken 380 tons for Wenatchee, Wash., and the American Cast Iron Pipe Co. has been awarded 156 tons for Seattle, Wash. Fairfield, Cal., has placed 248 tons with an unnamed company. Prices are unchanged.

Rails.—The Los Angeles Flood Control District will open bids Feb. 28 on 1800 tons of 60-lb. to 80-lb. rails.

The Page Fence and Wire Products Association at its fifth annual meeting, held at the Book-Cadillac Hotel, Detroit, during the first week of February, voted to change its name to the Page Fence Association. The organization is made up of dealers and jobbers of products of the Page Steel & Wire Co., Bridgeport, Conn.

Heavy Shipments from Youngstown District Mills

YOUNGSTOWN, Feb. 15.—The principal change this week in Valley steel operations is in the blowing out of A blast furnace in its Campbell group by the Youngstown Sheet & Tube Co. for relining and rebuilding. This suspension follows the resumption last week of No. 5 blast furnace in the Ohio Works group of the Carnegie Steel Co. In steel-making and rolling mill divisions, production ranges from 80 to 85 per cent. The Trumbull Steel Co. has suspended one of its eight open-hearth furnaces for repairs; 106 sheet mills are active against 112 the week previous; 14 of 18 tube mills are under power.

Producers report heavier shipments to date in February than for the corresponding period in January. Mills have large tonnages of low-priced sheets and strips on their books, so that prices now promise to firm up.

Scrap Declines at Detroit

DETROIT, Feb. 15.—The market on old material in this district has registered a slight decline, owing to an increase in production and the fact that the larger consumers have not commenced buying.

Heavy melting and shoveling steel	$13.00 to $13.50
Borings and short turnings	8.50 to 9.00
Long turnings	7.75 to 8.25
No. 1 machinery cast	17.00 to 18.00
Automobile cast	17.50 to 18.00
Hydraulic compressed	11.25 to 11.75
Stove plate	13.50 to 14.50
No. 1 busheling	11.00 to 11.50
Sheet clippings	8.25 to 8.75
Flashings	11.25 to 11.75

Galvanized Sheet-Metal Ware Shipped in 1926 Was Nearly $8,000,000

WASHINGTON, Feb. 15.—December shipments of galvanized sheet-metal ware, as reported to the Department of Commerce by 12 concerns comprising a large proportion of the industry, were 123,381 dozens, valued at $479,876, as compared with 119,841 dozens, valued at $534,066, in November.

For the year the shipments aggregated 1,945,164 dozens, valued at $7,950,683. Of these totals, pails and tubs accounted for 1,425,672 dozens and a value of $5,010,939. Other items amounted to 519,492 dozens, valued at $2,939,744. Production slightly exceeded shipments.

New Research Laboratories in California

Announcement is made of the opening of the Double "EE" Research Laboratories located in Fullerton, Cal. The laboratories will handle metallurgical work of all kinds, assays and analyses, surveys, engineering estimates, commercial processes and cost accountings with processes installed. The company has appointed Edwin C. Jordan as head metallurgist.

Cost of living in the United States in December is reported by the Bureau of Labor Statistics to be 75.6 per cent higher than in 1913. There had been an increase of 0.5 per cent since last June, but a 1.3 per cent decrease from December, 1925, and a decrease of 18.9 per cent from June, 1920. Food, clothing and housing were below the general average in December, while fuel and light, house furnishing goods and miscellaneous were considerably above the average.

The Sharon Steel Hoop Co., Sharon, Pa., reports net profits for 1926, after Federal taxes, depreciation, depletion, etc., of $1,381,715, equivalent after preferred dividends to $4.54 a share on the common stock outstanding. This is equal to 9.08 per cent on the par value of the common stock.

FABRICATED STRUCTURAL STEEL

Awards of 37,500 Tons Include Several Large Jobs—Inquiries Are Light

Structural steel awards of the week totaled about 37,500 tons, of which 8850 tons is for buildings for gas companies in the New York district and 6500 tons is for a New York State office building at Albany. Among inquiries is one for 7200 tons for a church to be built on Riverside Drive, New York. Awards follow:

HARTFORD, CONN., 500 tons, County Court House to Levering & Garrigues Co.

BOSTON, 100 tons, power house addition, W. F. Schrafft & Sons Corporation, to Berlin Construction Co.

NEW YORK, 8850 tons, boiler house, New York & Queens Gas Co.; office building, Irving Place and Fourteenth Street, and shop and storage building for Consolidated Gas Co., to McClintic-Marshall Co.

ALBANY, N. Y., 6500 tons, New York State office building, to A. E. Norton, Inc.

NEW YORK, 1000 tons, loft building at 336 West Thirty-seventh Street, to Hay Foundry & Iron Works.

NEW YORK, 600 tons, two garages, to an unnamed fabricator.

NEW YORK, 450 tons, a hospital and two churches in vicinity of New York, to an unnamed fabricator.

PAULSBORO, N. J., 700 tons, building for Vacuum Oil Co., to Shoemaker Bridge Co.

PHILADELPHIA, 400 tons, municipal highway bridge, to McClintic-Marshall Co.

PHILADELPHIA, 200 tons, Hospital for the Insane, to McClintic-Marshall Co.

PHILADELPHIA, 150 tons, substation for Philadelphia Electric Co., to American Bridge Co.

CHARLESTON, W. VA., 390 tons, State bridge, to Pittsburgh-Des Moines Steel Co.

PADUCAH, KY., 220 tons, pipe supports for the Illinois Central to Mississippi Valley Structural Steel Co.

NEW ORLEANS, 700 tons, Monteleon Hotel, to Lukens Steel Co.

NEW ORLEANS, 2100 tons, seven barges for the International Cement Corporation, to Nashville Bridge Co.

HOUSTON, TEX., 3000 tons, tanks, to Chicago Bridge & Iron Co.

GRANITE CITY, ILL., 850 tons, Commonwealth Steel Co. mill, to McClintic-Marshall Co.

MINNEAPOLIS, ST. PAUL & DUBUQUE, 1200 tons, boats for municipal docks, to Marietta Mfg. Co., Point Pleasant, W. Va.

MILWAUKEE, 2000 tons, bridge work for the Milwaukee Electric Railway & Light Co., to Lakeside Bridge & Steel Co.

TWO RIVERS, WIS., 220 tons, Washington Street bridge, to Milwaukee Bridge Co.

KELLOGG, IDAHO, 1500 tons, buildings for the Bunker Hill Smelting & Refining Co., to Minneapolis Steel & Machinery Co.

SPOKANE, WASH., 1400 tons, municipal pipe line; 1200 tons to Steel Tank & Pipe Co. of Oregon, and 200 tons to Beale Tank & Pipe Co.

LOS ANGELES, 275 tons, pipe line, to Western Pipe & Steel Co.

BLYTHE, CAL., 650 tons, bridge over the Colorado River, to Virginia Bridge & Iron Co.

LONG BEACH, CAL., 1000 tons, power house for Southern California Edison Co., to Llewellyn Iron Works.

LONG BEACH, 900 tons, Masonic Temple, to Baker Iron Works.

TORRANCE, CAL., 100 tons, crane runway for International Derrick Co., to McClintic-Marshall Co.

SAN BERNARDINO, CAL., 500 tons, department store, to Union Iron Works.

OAKLAND, CAL., 240 tons, Lowell School, to California Steel Co.

SAN FRANCISCO, 600 tons, apartment building, to Golden Gate Iron Works.

SAN FRANCISCO, 100 tons, theater, to Schrader Iron Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 7200 tons, Park Avenue Baptist Church on Riverside Drive.

READING RAILROAD, 375 tons, bridge.

BUFFALO, 500 tons, factory for National Biscuit Co.

WHITE SULPHUR SPRINGS, W. VA., tonnage not stated, Green Briar Hotel.

ASHLAND, KY., 2500 tons, mill building for American Rolling Mill Co.

SAVANNAH, GA., 800 tons, viaduct for the Central of Georgia Railroad.

STOCKTON, CAL., 200 tons, apartment.

SAN FRANCISCO, 1800 tons, pipe line for the Feather River Power Co.; bids Feb. 21.

SAN FRANCISCO, 1400 tons, Builders' Exchange, and 400 tons for a theater.

LOS ANGELES, 1000 tons, Paden Building.

RAILROAD EQUIPMENT

Week's Orders Totaled 700 Freight Cars and 490 Are Inquired For

Only 700 freight cars were ordered within the past week, and the volume of business pending is small. Inquiries appeared for a total of 490 cars. Details of the week's business follow:

The Southern Pacific is in the market for 200 tank cars.

The Chicago & North Western has ordered 500 70-ton hopper cars from the Pressed Steel Car Co.

The Chesapeake & Ohio has ordered 500 70-ton car bodies from the Illinois Car & Mfg. Co.

The Kansas City, Mexico & Orient is inquiring for 40 ballast cars.

The Duluth, Missabe & Northern is inquiring for 250 ore cars.

The Duluth & Iron Range Railroad is in the market for ore cars, the number not stated.

The Pittsburgh Provision & Packing Co. has ordered 4 refrigerator cars from the American Car & Foundry Co.

The Southern Railway has ordered 4 steel underframes from the American Car & Foundry Co.

The Long Island Railroad has placed 127 steel passenger coaches with the American Car & Foundry Co.

The Chicago, Burlington & Quincy has purchased 200 refrigerator car underframes from the Ryan Car Co.

The North American Car Co. has placed 200 poultry cars with the Illinois Car & Mfg. Co.

The Great Northern is asking for prices on repairs to 50 flat cars.

Want Lock-Joint Sheet Pipe Removed from Present Rate Classification

WASHINGTON, Feb. 15.—In a petition made public yesterday request was made of the Interstate Commerce Commission by J. E. Johnson, as agent of the Southwestern carriers, to modify its description of wrought iron or steel pipe or tubing so as to limit it in order that it will not apply to lock-joint sheet iron or steel pipe, a cold-rolled product. Specifically the commission is asked to revise paragraph (a) of the pipe item in the commission's report of Feb. 6, 1923, to read: "(a) Wrought iron or steel pipe, not plate or sheet * * * and iron or steel boiler tubes, in straight or mixed carloads, minimum weight, 46,000 lb. Note: Ratings apply on pipe or tubing made from skelp iron or steel, or on seamless piping or tubing made from billets or disks."

The petition says that based upon recognized principles of rate-making, the finished pipe made from sheet steel should not be carried at the same charges as wrought iron pipe, made from skelp, or seamless tubing, made from billets. It is declared that the application is intended to make clear the distinction between these commodities and to harmonize the description.

The general trend in power plants at small mines is to use the oil engine, according to Robert H. Dickson, manager Verde Central Mines, Jerome, Ariz.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Feb. 15	Feb. 14	Feb. 11	Feb. 10	Feb. 9
Lake copper, New York....	13.00	13.00	13.00	12.87½	12.75
Electrolytic copper, N. Y.*.	12.75	12.62½	12.55	12.50	12.37½
Straits tin, spot, New York.	68.75	69.25	69.25	69.17½	69.25
Lead, New York.....	7.40	7.40	7.40	7.40	7.40
Lead, St. Louis.....	7.30	7.30	7.30	7.27½	7.25
Zinc, New York.....	7.02½	7.05	7.00	6.95	7.00
Zinc, St. Louis.....	6.67½	6.70	6.65	6.60	6.65

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Feb. 15. — Fair activity pervades most of the markets. Copper has been advancing on heavy buying. The tin market continues strong with sales of good proportions. Buying of lead has increased and prices are a little higher. Changes in the zinc market have been slight with quotations largely nominal.

Copper.—Consumers, having been convinced about a week ago that electrolytic copper had virtually reached its lowest level, started to buy and since then the market has been active and prices have advanced almost every day. Both domestic and foreign consumers have been heavy purchasers and the turnover has been very large. Electrolytic copper is quoted today at 13c., delivered in the Connecticut Valley, or about ½c. per lb. higher than a week ago. Copper Exporters, Inc., has also increased prices three times within the week, adding ⅛c. per lb. each time, the price effective today being 13.37½c. c.i.f. Hamburg. Statistics for January were issued yesterday and showed an increase in stocks of refined copper of 8481 tons over December, bringing the surplus in producers' hands to the largest total since March, 1925. The advance in prices has been rapid and whether it will be maintained or further increased is a question.

Indications are that production has scarcely been reduced and consumption has not increased, two factors on which the future of the market depends. Lake copper is quoted at 13c., delivered.

Tin.—Sales for the week have been about 1000 tons and prices have been exceedingly firm. Dealers have been the principal buyers with very little heard from consumers. The market as a whole is devoid of feature. An interesting incident is the fairly large shipments of tin from England, one steamer bringing 350 tons. Despite this, English stocks remain stationary, showing that production is increasing. Shipments from the Straits continue small. It is evident that stocks, particularly for prompt shipment, are light and that a premium on spot delivery will prevail for two or three months. Yesterday the market was stagnant and today buying was only moderate, mostly for March-April, with spot Straits tin quoted at 68.75c. New York, largely nominal. It is stated that the London market needs support from this side which is partly confirmed by a bad break in prices there today, with spot standard quoted at £304, future standard at £293 and spot Straits at £312 per ton. The Singapore price today was £303 5s. Arrivals thus far this month have been 2495 tons, with 5515 tons reported afloat.

Lead.—The market has been active and buying has been quite heavy. The leading interest continues to quote 7.40c. as its New York contract price, at which it is reported as taking business even for early shipment. In the outside market prices have advanced and sales have been made at 7.30c., St. Louis, with a few transactions equivalent to 7.60c., New York.

Zinc.—Ore prices have advanced $1 a ton to $43, which in part explains the higher prices for prime Western zinc which now prevail. Sales in the last day or two have been made as high as 6.70c., St. Louis, but demand is not large and the amount available at a range of 6.65c. to 6.70c., is limited. The market today is quotable at 6.67½c., St. Louis, or 7.02½c., New York.

Antimony.—There is less pressure on the market from consumers and prices are a little easier with

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig	69.50c. to 70.50c.
Tin, bar	71.50c. to 72.50c.
Copper, Lake	14.25c.
Copper, electrolytic	14.00c.
Copper, casting	13.50c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	8.25c. to 8.75c.
Lead, bar	10.75c. to 11.25c.
Antimony, Asiatic	16.50c. to 17.00c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure)	29.00c. to 30.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ⅛ and ½	43.00c. to 44.00c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	74.50c.
Tin, bar	76.50c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc, slab	8.25c.
Lead, American pig	8.25c.
Antimony, Asiatic	20.50c.
Lead, bar	10.00c.
Babbitt metal, medium grade	20.75c.
Babbitt metal, high grade	74.50c.
Solder, ½ and ½	43.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	17.87½c. to 18.87½c.
Copper, hot rolled	21.50c. to 22.50c.
Copper, cold rolled, 14 oz. and heavier	23.75c. to 24.75c.
Seamless Tubes—	
Brass	22.75c. to 23.75c.
Copper	23.50c. to 24.50c.
Brazed Brass Tubes	26.37½c. to 27.37½c.
Brass Rods	15.62½c. to 16.62½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	12.75c. to 13.00c.
Zinc sheets, open	13.25c. to 13.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were advanced ¼c. on Feb. 11, following a reduction of ½c. on Feb. 4. Zinc sheets and lead full sheets are still being quoted at the reductions of Jan. 10 and 24, respectively.

List Prices per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	17.87½c.
Copper, hot rolled	21.50c.
Zinc	11.00c.
Lead (full sheets)	11.00c. to 11.25c.
Seamless Tubes—	
High brass	22.75c.
Copper	23.50c.
Rods—	
High brass	15.62½c.
Naval brass	18.37½c.
Wire—	
Copper	14.87½c.
High brass	18.37½c.
Copper in Rolls	20.37½c.
Brazed Brass Tubing	25.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	17⅞c.
Copper, hot rolled	21.50c.
Copper, cold rolled, 14 oz. and heavier	23.75c.
Zinc	12.00c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	22.75c.
Copper	23.50c.
Brazed Brass Tubes	25⅞c.
Brass Rods	15⅝c.

Chinese metal quoted at 14.50c., New York, duty paid, for both spot and future delivery.

Nickel.—Wholesale lots of ingot nickel are quoted unchanged at 35c., with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Markets in Chicago

FEB. 15.—More active buying has brought about advances in the prices of tin, lead and zinc. Stocks of antimony have accumulated and the price is lower. The demand for old metals has improved and prices are steadier.

We quote in carload lots: Lake copper, 13c.; tin, 69.25c.; lead, 7.35c.; zinc, 6.70c.; in less than carload lots, antimony, 14.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 6.25c.; zinc, 4.25c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 15c.; all being dealers' prices for less than carload lots.

REINFORCING STEEL

Awards of About 5500 Tons Include Akron, Ohio, Job of 1850 Tons

Awards of concrete reinforcing bars totaled about 5500 tons in the week, including 1850 tons for the O'Neil department store at Akron, Ohio. Inquiries are very light. Awards follow:

BOSTON, 300 tons, Paige-Detroit Motor Car Co. salesroom and garage, to Truscon Steel Co.

NEW YORK, 250 tons, subway work, D. C. Serber, Inc., general contractor, to Igoe Brothers.

BROOKLYN, 125 tons, Fox Theater, to Ferro Building Products Co.

OAKDALE, L. I., 100 tons, building for LaSalle Military Academy, to McClintic-Marshall Co.

MAURER, N. J., 100 tons, building for Barber Asphalt Co., to McClintic-Marshall Co.

FORT MONMOUTH, N. J., 470 tons, Army barracks, to Concrete Steel Co.

AKRON, OHIO, 1850 tons, O'Neil department store, to Pollak Steel Co.

NEW ORLEANS, 300 to 400 tons, Sewage and Water Board, to Tennessee Coal, Iron & Railroad Co.

CHICAGO, 300 tons of rail steel, Illinois State road work, to Kalman Steel Co.

CHICAGO, 150 tons, foundations for the Midland Club, to Concrete Steel Co.

MILWAUKEE, 350 tons, Schroeder Hotel, to American System of Reinforcing.

SAN FRANCISCO, 327 tons, improvements on Golden Gate Heights, to an unnamed local jobber.

SAN FRANCISCO, 300 tons, building for the Daily News Publishing Co., to Badt-Falk Co.

SAN FRANCISCO, 200 tons, factory at Tenth and Bryant Streets, to Gunn, Carle & Co.

SAN FRANCISCO, 150 tons, hospital, to an unnamed local jobber.

SACRAMENTO, 165 tons, for the County Hospital, to an unnamed San Francisco jobber.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	10.75c.	12.50c.
Copper, heavy and wire	10.75c.	11.75c.
Copper, light and bottoms	8.75c.	10.25c.
Brass, heavy	6.50c.	8.00c.
Brass, light	5.75c.	7.25c.
Heavy machine composition	8.25c.	9.75c.
No. 1 yellow brass turnings	7.75c.	8.50c.
No. 1 red brass or composition turnings	7.75c.	8.75c.
Lead, heavy	6.25c.	6.75c.
Lead, tea	4.25c.	5.00c.
Zinc	3.75c.	4.25c.
Sheet aluminum	15.00c.	17.00c.
Cast aluminum	15.00c.	17.00c.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 100 tons, surgical building at City Hospital.

JERSEY CITY, 500 tons, bridge over Hackensack River for Delaware, Lackawanna & Western Railroad; George A. Curtis Co., general contractor.

DANVILLE, N. J., 125 tons, St. Frances Health Resort; general contract not let.

CLEVELAND, 700 tons, warehouse, Kroger Grocery & Baking Co.; H. K. Ferguson Co., general contractor.

EVANSTOWN, ILL., 125 tons, St. George High School, Joe W. McCarty, architect.

CHICAGO, 110 tons, L. Klein furniture store, 11343 South Michigan Avenue, Halperin & Braun, architects.

ST. LOUIS, 110 tons, St. John's Hospital Nurses' Home.

Recommends Lower Rates from Troy Furnace to New England

WASHINGTON, Feb. 15.—Passing upon the complaint of the Hudson Valley Coke & Products Corporation, which blew in a furnace in Troy, N. Y., in March, 1926, Examiner W. J. Harris in a report made public today recommended that the Interstate Commerce Commission find that rates on pig iron from Troy to New England points are unreasonable and unduly prejudicial. The examiner fixed a scale of rates which is intended to compare with that on the New York, New Haven & Hartford Railroad covering pig iron from the new Mystic furnace at Everett, Mass., to points in New England.

The scale proposed by the examiner from the Troy furnace ranges from $2.50 per gross ton for 105 miles and under, no hauls for distances less than 100 miles being shown, to $3.65 per ton for 216 miles and over. Present rates from Troy to New England points are $3.66 and $3.78 per ton. The rates depend more on the routes over which shipments from Troy are sent than the distances. The rate of $3.66 applies to 13 representative points in New England with an average distance of 177 miles, while the rate of $3.78 applies to 10 representative points in New England with an average distance of 142 miles. The proposed scale set up by the examiner would reduce rates from Troy to New England points considerably, ranging up to approximately 90c. per ton. It is claimed that at present to equidistant New England points the Mystic furnace now has rates that are virtually that much lower than from Troy.

Shipments of Locomotives

WASHINGTON, Feb. 15.—Based on reports received by the Department of Commerce, shipments of railroad locomotives in January totaled 57 as compared with 185 in December and 126 in January, 1926. Of the January, 1927, shipments 47 were steam locomotives and 10 electric locomotives. Shipments for domestic use in January included 16 steam and eight electric locomotives, as against 31 steam and two electric locomotives shipped abroad.

PERSONAL

L. H. Burnett, for several years assistant to the president, Carnegie Steel Co., Pittsburgh, was elected a vice-president at a meeting of the board on Feb. 15. Although educated for the legal profession, Mr. Burnett has been associated with the steel business for more than 25 years, starting as clerk to the solicitor of the Carnegie Steel Co. Sept. 1, 1901. Successively he was assistant solicitor, vice-president of the land companies of the Carnegie company, and then assistant to president with all land matters, taxation, workmen's compensation, and numerous other duties placed under his supervision and direction. It was due to Mr. Burnett that the subject of safety was taken up intensely by the Carnegie Steel Co., he having organized that department of the company 20 years ago. Mr. Burnett was born at Springfield, Ohio, in 1874. He attended Kenyon College, Gambier, Ohio, and was graduated from the Columbia University law school.

L. H. BURNETT

—

Val Lee has been appointed receiver of the Whipp Machine Tool Co., Sidney, Ohio, and will continue to operate the plant. The action was ordered by the Common Pleas Court on the petition of the First National Exchange Bank of Sidney.

—

A. P. Grohens was elected president and general manager of the Lambert Machine Co., Marshall, Mich., at the annual meeting of the board of directors. Other officers to serve this year are John R. Smyth, vice-president; William A. Grohens, secretary, and R. F. Grohens, treasurer.

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T. J. Cornwall has been elected president of the Foundrymen's Association of Indianapolis. Guy E. Street was named vice-president and James H. Hooker was re-elected treasurer. J. B. Lewis and Ferris T. Taylor were appointed to the executive committee.

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E. T. Weir, president Weirton Steel Co., sailed this week for a six weeks' stay in Bermuda.

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Ralph H. Anderson has been added to the sales force of Stedfast-Roulston, Inc., Boston, machinery dealers, successor to Hill, Clarke & Co., Inc. His territory will include Maine, New Hampshire and Vermont.

—

R. G. Knickerbocker, mining and metallurgical engineer, who has been engaged for the past year in the development of an iron sands deposit for the Tokiwa Co., Ltd., Kuji, Iwate-ken, Japan, sailed for Seattle Feb. 4 and will be located upon his return at Rolla, Mo.

—

C. W. Lighthall, who has been factory manager of the Hoover Steel Ball Co., Ann Arbor, Mich., since the founding of the company, has been promoted to the position of general manager to succeed H. D. Runciman, resigned. He will continue to be a member of the board of directors.

—

Charles C. Phelps, 473 Getty Avenue, Paterson, N. J., has been appointed sales engineer in the metropolitan New York and northern New Jersey territory for the Hill Clutch Machine & Foundry Co., Cleveland, maker of power transmission machinery.

—

Frank I. Hoover, associated for many years with the Central Iron & Steel Co., Harrisburg, Pa., has been appointed assistant general sales manager of the company with headquarters at the main office.

—

George W. Kennedy, vice-president and assistant general manager of the Kelsey Wheel Co., Detroit, has been elected president of the company to succeed the late John Kelsey. He became associated with the company eight years ago as assistant to the president, and shortly afterward became assistant treasurer. Bert Morley, sales manager of the company for 18 years, has been elected vice-president to succeed Mr. Kennedy and will also be general manager. He came to the company one year after its founding.

—

H. O. K. Meister, assistant sales manager of the Hyatt Roller Bearing Co., Newark, N. J., for the last 18 months, has been appointed general sales manager. He joined the Hyatt organization 14 years ago as an engineer in the Newark office. Later he was transferred to Chicago, and prior to his return to Newark as assistant sales manager he supervised the company's sales in the Western territory. A. W. Scarratt, for the last few months assistant chief engineer for the Hyatt company, has been named chief engineer.

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Helmer Gille and Sten Agri of the Hellsfors Bruks Aktiebolag, Hellesfors, Sweden, sailed for home on Feb. 12, after having spent two months in this country visiting steel plants. Mr. Gille is superintendent of the company's blast furnace and open-hearth department.

—

A. B. Dunsmore, Wellsboro, Pa., and E. E. Jones, Wilkes-Barre, Pa., have been appointed receivers for the Sheldon Axle & Spring Co., Wilkes-Barre, manufacturer of automobile bumpers, fenders, springs, etc. The Bethlehem Steel Co. is the company's principal creditor.

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Dr. Walter B. Jones, research professor of education, University of Pittsburgh, will be the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association on Monday evening, Feb. 21, at the Fort Pitt Hotel, Pittsburgh. His subject will be, "The Training of Pattern-Making Apprentices."

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Curtis B. Friday and Norman N. Hench have been appointed sales engineers in the rail bureau, general sales department, Illinois Steel Co., Chicago. Mr. Friday will specialize in wheels and forgings and Mr. Hench, in track accessories.

—

William J. Woolley, vice-president Wolff Mfg. Corporation, Chicago, manufacturer of plumbing supplies, has been elected president of the corporation, succeeding the late Dr. J. T. Duryea. Mr. Woolley was the organizer of the National Trade Extension Bureau which plans sales promotion for the plumbing and heating industry. He is also vice-president of the Pierce, Butler & Pierce Mfg. Corporation, New York. Joseph A. Bower, vice-president of the New York Trust Co., New York, has been made chairman of the finance committee of the Wolff corporation.

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John C. White, president Arrowhead Iron Works of Pennsylvania, Inc., Pittsburgh, who recently joined the sales organization of the Blaw-Knox Co., Pittsburgh, has been appointed sales manager in the company's steel grating and flooring department.

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C. H. Booth, a director of the Youngstown Sheet & Tube Co., and a prominent industrial and financial executive of the Mahoning Valley, has been elected chairman of the Ohio Leather Co., Girard, Ohio.

F. A. Everding, at one time connected with the American Trading Co. and until recently in the steel purchasing department of the Mitsubishi Shoji Kaisha, 120 Broadway, New York, has resigned to enter into the export and import of steel under his own name, with an office at 120 Liberty Street, New York.

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George L. Anderson has been appointed Indianapolis district sales manager for the Union Drawn Steel Co., Beaver Falls, Pa. M. A. Williams is assistant. The company's offices are located at 1310 Merchants Bank Building, Indianapolis.

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Warren S. Blauvelt, formerly president Indiana Coke & Gas Co. and during the war a member of the Fuel Administration, has been made executive head of the Hudson Valley Coke & Products Corporation, Troy, N. Y.

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W. C. Conger, sales manager Truscon Steel Co., Youngstown, Ohio, has been elected vice-president and director.

Blast Furnace Manager Honored

B. W. Marron, general manager of the Hanna Furnace Co., Buffalo, was honored at a dinner on Jan. 15 given by his associates and employees of the company on the occasion of his twenty-fifth anniversary as manager of the Hanna furnaces at Buffalo. He was presented with a silver pitcher and tray, suitably engraved, by his employees, and in accepting he spoke of the loyalty which he had always received from his associates. Original songs composed by John J. Sammon, general superintendent of the Hanna furnaces at Buffalo, were a feature of the evening, and each course of the dinner was designed to denote some part or product of blast furnaces. C. A. Collins, president of the Hanna Furnace Co., presided as toastmaster, and other guests included officials of the Hanna company at its other plants.

B. W. MARRON

Mr. Marron began his career with the old Cedar Point furnaces on Lake Champlain, and during his active life has been associated with such figures as the late John W. Gates, at one time president of the Illinois Steel Co., the late C. H. Foote and the late Senator M. A. Hanna. At the time he was manager of the South Chicago works of the Illinois Steel Co., Judge Gary was the company's attorney. His many other associations and long period of service make Mr. Marron one of the outstanding blast furnace men in the country, and the anniversary dinner offered a pleasant opportunity to show appreciation well deserved.

Shipments of electric industrial trucks and tractors in January, as reported to the Department of Commerce by nine leading manufacturers, numbered 90, of which 17 were for export. Of the domestic shipments, six were tractors and 67 were of other types. Compared with December, this represents a drop of 28 in the total, although there was a heavy gain in the export shipments. In January, 1926, the total was 111.

The United States Civil Service Commission, Washington, announces an open competitive examination for junior metallurgists to fill vacancies at the Engineering Experiment Station, United States Naval Academy, Annapolis, Md. Applications must be made prior to March 13.

OBITUARY

BENJAMIN NIKOLAS BROIDO, chief engineer industrial department, Superheater Co., New York and Chicago, died suddenly Feb. 10 at his home in the former city. He was born at Wilna, Russia, in 1879 and was graduated in 1904 from Frederick's Polytechnic, Gothen, Germany. Following connections with prominent makers of superheaters and boilers in Germany he came to this country in 1914 and took post-graduate work at the College of the City of New York and at Columbia University.

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RICHARD S. CHISOLM, for some years president of the United Metals Mfg. Co., Norwich, Conn., died Feb. 12 at his home in New York.

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WILLIAM R. MERRICK, secretary and auditor of the Youngstown Steel Co., Youngstown, died Feb. 12 at his home in that city, following a short illness. He had been associated with that and other Valley steel companies during the greater part of his business life.

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JAMES H. PARK, former vice-president and a director of Crucible Steel Co. of America, died in Augusta, Ga., Feb. 13. He was born in Pittsburgh in 1853, and in 1873 joined his father, who was one of the founders of Park Brothers & Co. (Black Diamond Steel Works), in the steel business. When the company became one of the units of the Crucible company in 1900, Mr. Park remained with the new organization as a director and later was elected a vice-president. He was well known in civic and philanthropic work and organizations of Pittsburgh.

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WILLIAM O. SPEER, active for many years in the steel castings business at Pittsburgh as part owner of the Reliance Steel Castings Co., died recently in Los Angeles, where he made his home since his retirement from active business five years ago.

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ROBERT GRANT, vice-president and trustee Massachusetts Gas Co., died at the Macleod Hospital, Boston, on Feb. 8, aged 52 years. Mr. Grant was president and trustee New England Fuel & Transportation Co., president and a director of the New England Coal & Coke Co., and a director of the Mystic Iron Works.

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U. GRANT TEETSELL, president of the Holt-Lyon Co., Inc., Saugerties, N. Y., died on Jan. 22.

Sulphuric Acid from Smelting Nickel Ores in Canada

How sulphuric acid is extracted from smelter gases was described by W. H. De Blois, manager chemical division Mond Nickel Co., Ltd., Coniston, Ontario, Canada, at a joint meeting of the Society of Chemical Industry and the Canadian Institute of Mining and Metallurgy at the Mount Royal Hotel, Montreal, in January.

Mr. De Blois explained that for the last 25 years in the smelting of nickel ores, millions of tons of sulphur have been discharged as waste gases. The company's plant near Sudbury, which was started a little over a year ago, is the first to use smelter gases direct for the manufacture of sulphuric acid by the contact process. The result is that Canada now has a supply of sulphuric acid at a cost considerably below former costs and lower than those at present prevailing in the United States. In fact, it will be possible to ship this acid into the Northern States, due to the low cost of production. Hitherto all acid in Canada has been made from imported brimstone or from deposits of pyrites not well located.

BOILER MAKERS REPORT

Production of Steel Boilers to Be Made Known Monthly Through Department of Commerce

MONTHLY reports of orders taken for steel boilers will be made to the Bureau of Census, Department of Commerce, by the members of the American Boiler Manufacturers' Association as a result of action taken at a mid-winter meeting held at the Hotel Cleveland, Cleveland, Feb. 11. From the data thus obtained the department will issue a monthly report of orders placed for boilers in units and in square feet, classified for all types of steel boilers.

A preliminary report, the first to be prepared by the Department of Commerce covering the boiler-making industry, was presented, this being compiled from figures submitted by 58 boiler manufacturers representing over 90 per cent of the productive capacity. This covered orders taken during 1919 to 1925 inclusive and the first half of 1926. In discussing the report, President George W. Bach, Union Iron Works, Erie, Pa., referred to the steady gain in sales of steel boilers for heating purposes, which had increased from less than 2000 in 1919 and in 1920, to 8000 in 1925 and to 6162 in the first half of last year.

To Try to Obtain Full Reports

Members having generally agreed that reports of boiler sales will be of much value to the industry, the association will endeavor to secure the cooperation of all members, so that the reports will come from approximately 100 per cent of the industry. A representative of the Department of Commerce stated that figures showing boiler sales are a fairly accurate index of current business conditions.

The meeting was attended by about 50 members of the association. Trade extension work was the subject of some discussion and this work will be continued. The association will hold its annual meeting in May, probably either at Hot Springs, Ark., or White Sulphur Springs, W. Va.

Steel Boiler Output Uses 200,000 Tons of Iron and Steel Annually

WASHINGTON, Feb. 11.—During the first half of 1926 orders for 8931 steel boilers were received by 58 manufacturers, representing most of the leading makers, according to a preliminary report of the Department of Commerce. For the full year 1925 these makers shipped 13,417 boilers, and 12,215 in 1924. More boilers were shipped in 1925 than in any other year since the war, except that in square footage, 1920 shipments were the highest, followed by those of 1923.

Shipments of Steel Boilers

	Number	Sq. Ft. of Heating Surface	Average Sq. Ft.
1919	10,002	16,158,208	1,615
1920	10,308	17,921,492	1,739
1921	6,543	8,522,821	1,303
1922	11,244	12,623,264	1,123
1923	13,169	16,507,132	1,254
1924	12,215	14,554,989	1,192
1925	13,417	14,692,232	1,095
1926(a) ...	8,931	8,673,700	971

(a) Orders received, first half only.

The report says that, of the various types of boilers reported, only steel heating stationary boilers and Scotch marine boilers showed increases over 1924, both in number and in square feet of heating surface.

The 58 reporting concerns indicated that, on the average, between 1919 and 1925 the number of persons employed in their boiler departments was 8960, of which 880 were in the executive, engineering and sales organizations, 7210 in the shops and 870 engaged in erection work. These firms used annually during that period 90,078 net tons of plates, 17,095 tons of structural shapes, 8376 tons of bars, 53,253 tons of tubes and 23,495 tons of castings.

Japanese Government Encouraging Development of Machinery

Development of the machinery industry in Japan is being encouraged through the active cooperation of the Government, according to a report received by the Department of Commerce from Assistant Commercial Attaché Halleck A. Butts. The problems have been studied by specially appointed committees in Tokio, Osaka and Nagoya, which was acting under the instructions of the Government and have formulated plans regarding precision machinery, power machinery, spinning machines, machine tools and equipment.

The report says the Department of Commerce and Industry is to make arrangements for instructing workmen in the use of precision machines in those Government and private plants where a high degree of efficiency is maintained. Plants with superior efficiency, the report declares, are designated for this work in order that the Government may take measures to maintain their production capacity and assist in effecting improvements in manufacturing methods. The Government is to be asked to use its influence in establishing guilds and other associations composed of manufacturers of precision machinery, it is stated.

The report adds:

"Measures are to be taken to develop the manufacture of the larger types of machine tools. Vigorous efforts are to be made to extend the manufacture of precision machines for the manufacture of woodworking machinery, grinding and milling machines, automatic drills, gun barrel lathes, etc. Standard grades of precision machinery are to be established and subsidies given for the equipment coming up to these standards.

"Along the lines of power-generating machinery, the production of the following call for especial encouragement at this time: water tube steam boilers, steam turbines, gasoline engines, Diesel engines, and water wheels. The tariff on these classes of machinery is to be revised and subsidies arranged to encourage their manufacture. Experimental work looking toward their manufacture is to be arranged by the Government. A list of approved manufactures will be prepared by each department of the Imperial Government."

Metal Problem in High-Pressure Steam Plants

Profs. A. L. Mellanby and William Kerr read a paper on the use of high-pressure steam plants before the Institution of Mechanical Engineers, (London, England) in which they showed that the problem of materials exercises a controlling influence on all attempts to reach extreme pressures and temperatures. The need is frequently expressed for metals which will better withstand these conditions of greater stress. In regard to corrosion there is no reason why these evils should seriously increase, and as far as corrosion is concerned, a little more attention to the elimination of impurities and gases will do all that is necessary.

Metallurgists are apparently satisfied with the promise of nickel-chrome steels and alloys, but what is of particular concern is the retention of the mechanical properties of metals under conditions of greater temperature and pressure. The usual run of steels do not readily conform to these abnormal conditions. For example, at 900 deg. Fahr. and above, steels decompose steam, liberating hydrogen and undergoing some amount of oxidation. It has further been shown that at these high temperatures the steel develops creep effects, as a result of which it will fail at a much lower stress than that required for a straightforward break. This creep virtually amounts to a decrease in the safety factor. What is apparently required is a more comprehensive knowledge of the behavior of the metals at these high temperatures.

CAST IRON PIPE IMPORTS

Greatest Tonnage from French Maker—New York Principal Port of Entry—German Pipe Plays Small Part

WASHINGTON, Feb. 15.—Of the imports of 83,874 gross tons of cast iron pipe in 1926, France appears as the leading shipper with 57,074 tons and Belgium second with 22,248 tons. As these figures are based by the customs division on the port of shipment, they do not necessarily show the actual origin of the pipe. In addition to the tonnage attributed to France, all but a small portion, probably less than 1000 tons, of the Belgian shipments originated in France but were shipped through the port of Antwerp.

As in 1925, New York was the greatest port of entry in 1926, with a total of 21,017 tons, as against 20,856 tons during the former year, when the total imports of cast iron pipe amounted to 51,215 tons. In 1924 Los Angeles was the most important port of entry, receiving 26,076 tons, considerably more than half of the total imports for that year. In 1926, however, only 15,986 tons entered through Los Angeles.

The figures show that there were substantial shipments of foreign pipe through other ports of entry along the Atlantic and Gulf coasts in the immediate territories of important American cast iron pipe foundries. An interesting feature of these imports is the small part played by cast iron pipe of German origin, the total shipments of which reached only 2013 tons for the year. Imports from Canada registered a decline to a little more than one-third of the 1925 total. Purchases from the Netherlands increased.

United States Imports of Cast Iron Pipe, by Countries of Shipment, 1924 to 1926

(Gross Tons)

	1926	1925	1924
France	57,073	42,444	22,701
Belgium	22,248	6,874	22,674
Germany	2,013	....	166
Netherlands	946	9	8
Czechoslovakia	856	....	....
Canada	697	1,711	42
United Kingdom	38	96	1,300
Cuba	2	....	9
Switzerland	....	81	....
Total	83,873	51,215	46,900

United States Imports of Cast Iron Pipe by Countries of Shipment and Ports of Entry in 1926

(Gross Tons)

	France	Belgium	Germany	Netherlands	Czechoslovakia	Canada	United Kingdom	Cuba
New York	13,097	7,368	530	..	..	..	23	..
Massachusetts	6,600	..	..	..	282	..	..	..
Michigan	6,588	991	..	..	..	49	..	..
Galveston	6,282	28	..	..	..	..	..	..
Los Angeles	5,192	8,372	1,476	946	..	..	..	..
San Francisco	953	3,617	..	..	..	..	..	..
Maryland	3,265	241	7	..	..	..	..	..
Washington	3,272	..	..	..	..	..	..	..
South Carolina	3,595	486	..	..	..	..	..	..
Buffalo	..	..	..	..	..	6	..	..
Main and New Hampshire	..	..	..	..	..	1	..	..
Georgia	69	..	..	..	..	..	..	..
Florida	..	..	..	..	..	..	..	2*
Chicago	561	..	..	..	574	641	..	..
Connecticut	5,018	..	..	..	..	..	..	..
New Orleans	95	..	..	..	..	..	..	..
Porto Rico	..	..	..	..	..	..	1	..
Philadelphia	2,486	1,145	..	..	..	..	15	..
Total	57,073	22,248	2,013	946	856	697	38	2

*Returned shipment.

Nineteen Per Cent More Steel Used in Building River Craft

The use of steel in inland waterways craft last year, as measured by the launchings of the companies engaged in this branch of the steel fabricating industry, increased 18.7 per cent over 1925, reaching a total of 63,776 tons in 366 hulls, as compared with 53,710 tons in 269 pieces launched in 1925. This result from the annual canvass by THE IRON AGE of the companies engaged in the building of barges, tow boats, floating docks, etc., for use on the Ohio and Mississippi rivers and their tributary streams, is impressive in view of the fact that the increase in the use of steel for building and construction as a whole was a matter of only 11 per cent and that the indicated consumption of all finished steel was only 6.5 per cent greater in 1926 than the year before.

Barges, boats, caissons and docks usually run approximately 70 per cent to plates and 30 per cent to structural shapes, and on that basis last year's launchings represented a consumption of 44,643 tons of plates and of 19,133 tons of shapes.

Much of the river transportation equipment launched last year was for service within localized distances. With the completion of the canalization of the Ohio River, expected about the first of 1929, giving that river over its entire length a constant minimum water stage of 9 ft. and making possible its year 'round use, the building of barges and tow boats for through service should be materially stimulated. There also should be expansion in the demand for barges for the upper Mississippi River as the service started by the Federal Government becomes established.

The record of 1926 launchings is as shown on the table below.

Builder	Location	No. of Hulls	Tonnage of Steel
Dravo Contracting Co.	Pittsburgh	95	20,795
American Bridge Co.	Ambridge, Pa.	100	20,000
Jones & Laughlin Steel Corporation	Pittsburgh	51	6,375
Midland Barge Co.	Midland, Pa.	38	5,200
Charles Ward Engineering Works	Charleston, W. Va.	14	2,303
Marietta Mfg. Co.	Point Pleasant, W. Va.	20	2,300
Riter-Conley Co.	Leetsdale, Pa.	13	1,998
Howard Shipyards & Dock Co.	Evansville, Ind.	9	1,515
Alabama Dry Dock & Shipbuilding Co.	Mobile, Ala.	12	1,300
Nashville Bridge Co.	Nashville, Tenn.	14	1,190
	Total 1926 launchings	366	63,776
	Total 1925 launchings	269	53,710

Heavy Building Construction Continues

Construction contracts awarded in January amounted to $384,455,000, according to a statement of F. W. Dodge Corporation. Figures cover the 37 States east of the Rocky Mountains and represent about 91 per cent of the construction volume of the United States. The total was the second largest January on record, being about 16 per cent below January, 1926, which was the maximum.

As for many months, the largest item was for residence construction, this total being $167,866,000, or 44 per cent of all. Commercial buildings accounted for more than $80,000,000, while industrial buildings were below $28,000,000.

In several of the large districts the January construction was considerably greater than that of either December or January of last year. In the Middle Atlantic States these excesses were 15 per cent over December and 54 per cent over last January; in the Pittsburgh district the increases were 12 and 29 per cent, respectively; in the Central West the gain over last January was 7 per cent, but there was a drop of 33 per cent from December.

Machinery Markets and News of the Works

MACHINERY DEMAND DRAGS

This Month Not Up to Expectations in Volume of Business

Slowness of the Automobile Industry to Get Started Partly Responsible for Small Sales

MACHINE tool business during the past week has been only fair at best, prospective purchasers being slow in closing. Meager orders from the automobile industry have been partly responsible for the failure of bookings to come up to expectations. Reports from Detroit that automobile production is getting into its seasonal stride lend encouragement, however.

In some districts there are indications that February business will be no larger than that of January, and may be less. Inquiries are fairly numerous, but are mostly for single machines and orders are of the same character.

Several Western railroads are at work on lists of machine tool requirements and that for the Northern Pacific may soon appear in the market. The Chicago, Milwaukee & St. Paul has ordered a number of machines.

The Illinois Steel Co.'s list, issued a week or so ago, may not be purchased before summer or early fall.

The monthly report of the National Machine Tool Builders' Association shows a downward trend in machine tool buying. January averaged slightly higher than December, but not enough to keep the three months' average—November, December and January—from turning downward. Net orders in January averaged 120.5, the base of 100 representing average sales for 1922, 1923 and 1924.

New York

NEW YORK, Feb. 15.

MACHINE tool business continues in moderate proportions, with no buying of outstanding importance. A fair amount of business is being done by some sellers, but conditions are spotty, and there is an uneven distribution of orders. An automobile company in New York State bought a worm grinder; an electrical plant at Bridgeport, Conn., bought a 13-in. geared head lathe and an electrical company in Massachusetts purchased a jig borer. A press manufacturer in New York State bought a vertical shaper and another vertical shaper goes to a company at Anderson, Ind.

R. Hoe & Co., Inc., 504 Grand Street, New York, manufacturer of printing presses, knives, saws, etc., has work under way on a factory branch at Birmingham, for which a general contract recently was let to the Mackie-Shepherd Co., 910 North Nineteenth Street, Birmingham. It will be one-story, 50 x 140 ft., and equipped primarily for saw production.

The Feiner Auto Spring Co., 119 West Fifty-second Street, New York, has purchased a three-story building at 506 West Fifty-third Street, and will remodel for a new plant. The company recently sold its property at the first noted location and will remove to the purchased building.

Victor Mayper, 15 East Fortieth Street, New York, architect, has filed plans for a six-story automobile service, repair and garage building, 100 x 102 ft., at 1260-68 Third Avenue, estimated to cost $200,000 with equipment.

The State Department of Charities, Capitol Building, Albany, N. Y., will take bids in the spring for a new power plant at the State hospital at Raybrook, reported to cost more than $60,000. S. W. Jones, Capitol Building, is architect.

The Rubel Coal & Ice Corporation, Glenmore Avenue and Junius Street, Brooklyn, has acquired the Ebling Brewery Co. plant in the Bronx, New York, and will remodel for a new ice-manufacturing plant. The entire project will cost in excess of $750,000.

The Neptune Meter Co., 50 East Forty-second Street, New York, manufacturer of water meters and parts, has removed the equipment at the plant of the Thomson Meter Co., 110 Bridge Street, Brooklyn, to its works at Long Island City, where an addition has been completed. Arrangements have been made for the sale of the former Thomson factory.

The Board of Education, 500 Park Avenue, New York, has authorized plans drawn for three new high schools, each to cost in excess of $1,500,000, to be provided with manual training and shop departments. One, to be known as the Seward Park high school, to be four or five stories, will be located on site of the old Ludlow Street jail; another will be in the vicinity of Coney Island, Brooklyn, and the third, at Tilden Avenue and East Fifty-seventh Street, Brooklyn. William H. Gompert, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for the board.

Fire, Feb. 9, destroyed the five-story plant of the John Trageser Steam Copper Works, 445-59 West Twenty-sixth Street, New York, manufacturer of range boilers, steel drums, tanks, etc., with loss reported at close to $100,000. Plans for rebuilding are said to be under advisement.

Leo Stillman, 1993 Jerome Avenue, New York, architect, has taken out a permit for the erection of a one-story automobile service, repair and garage building, 90 x 226 ft., on Broadway, near 231st Street, to cost about $110,000 with equipment.

Fred W. Sauer, operating a machine and tool works at 465 Greenwich Street, New York, has leased 5000 sq. ft. in the building at 120 Sherman Avenue, Jersey City, for a new plant. It is understood that the present works will be removed to the new location.

Fire, Feb. 9, destroyed a portion of the storage and distributing section at the Brooklyn Navy Yard, with quantities of steel and copper sheets, brass tubing, and other finished metal products and equipment, with total loss estimated in excess of $1,000,000.

The Republic Truck Sales Corporation, 388 Fourth Avenue, Brooklyn, representative for the Republic motor truck, has leased 15,000 sq. ft. in the building at Queens Boulevard and Rawson Street, Long Island City, for a new service and repair branch.

The Merchants Refrigerating Corporation, 17 Varick Street, New York, has plans for a new one-story cold storage and refrigerating plant at Jersey City, N. J., to cost $100,000 with equipment.

The Bates Mfg. Co., 33 North Day Street, Orange, N. J., manufacturer of numbering machines and devices, has purchased property in the vicinity of its plant for future expansion.

The J. A. McCrane Motor Co., 638 Market Street, Paterson, N. J., will ask bids in March for a new one-story service, repair and garage building, 100 x 300 ft., to cost $100,000 with equipment. A. E. Sleight, 138 Washington Street, is architect.

The Safety Cable Co., West First Street, Bayonne, N. J., manufacturer of insulated wire cables, etc., has filed plans for a one-story addition to cost $25,000.

The Borough Council, Florham Park, N. J., is asking bids until Feb. 23 for equipment for a municipal waterworks, including deep well pumping plant, and 100,000-gal. capacity

elevated steel tank and tower. Clyde Potts, 30 Church Street, New York, is consulting engineer. J. T. Welsh is borough clerk.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, is arranging an expansion and improvement program to cost $25,462,000 during the year, to include the installation of additional equipment at the Kearny electric generating station, $2,500,000; extensions in transmission lines and facilities, $12,000,000; power substations and distributing facilities, $9,000,000; underground conduits, $1,000,000, and miscellaneous work.

The Societe Petrometal has changed its name to the American Petrometal Corporation, and is now located at 145 West Forty-first Street, New York.

The offices of the central sales division of the Hyatt Roller Bearing Co., Newark, have been removed from 1352 Union Trust Building to 806 Fulton Building.

Frank E. Kane, Inc., 109 East Twenty-ninth Street, New York, has succeeded to the business in asbestos fiber, formerly conducted by Charles W. Kane at 321 Stuyvesant Avenue, Brooklyn, and 1 Madison Avenue, New York. The agency for the Clayton Paving Co., Gainesville, Ga., is included in the business taken over by Frank E. Kane, Inc.

The H. K. Ferguson Co., Cleveland, has been awarded contract for an extension to the enameled wire works of the General Electric Co., Schenectady, N. Y. It will be one-story, saw-tooth type, 180 x 280 ft., and is estimated to cost $200,000.

New England

BOSTON, Feb. 14.

WITH new construction of metal-working plants in New England on a small scale, with machine shops reporting less new business and a surplus of machinists and industry in general slowing up, metal working shops are buying few machine tools. Local sales the past week, however, although all single tools, showed a slight increase over those for the previous week. A new turret lathe to a Massachusetts shop, and a used shear to a nearby heater manufacturer, were the largest transactions reported. Local dealers feel business will increase during the last half of February and in March. New inquiries, especially for single tools, are a little more frequent. A Lynn, Mass., plant is in the market for a 12-in. lathe, an upright drilling machine, a bench lathe and a wet tool grinder.

The Boston & Albany Railroad, South Station, is taking bids for a one-story, 41 x 112 ft. machine shop at Worcester, Mass. H. B. Freeman is the chief engineer.

The Pressed Metal Co., Campbell Street, Pawtucket, R. I., toys, etc., is contemplating the erection of an addition. No architect has been selected as yet. Darius Goff is president.

The New York, New Haven & Hartford Railroad is having plans prepared for an engine room addition at Dedham. A turbo-generator, condensers, cooling tower and miscellaneous equipment will be required.

Funk & Wilcox, 26 Pemberton Square, Boston, are taking bids for a two-story garage and service station to be leased by the Demer Motor Vehicle Co., Franklin Street, Cambridge.

The Film Projector Co., 805 Main Street, Hartford, Conn., capitalized for $100,000, has incorporated to manufacture automatic moving picture machines. G. Frederic Lincoln, 9 Wyllys Street, Hartford, is president.

The Connecticut Electric Service Corporation, Hartford, Conn., has authorized the construction of a steel tower transmission line from a point near Meriden to Montville, about 40 miles, estimated to cost $500,000. The company is affiliated with the Connecticut Light & Power Co., Waterbury. J. Henry Roraback is president.

The Joseph Pollak Tool & Stamping Co., 81 Freeport Street, Dorchester, Boston, has awarded a general contract to the C. C. Temple Co., 99 Chauncy Street, for its proposed three-story addition, 50 x 75 ft., to cost about $65,000 with equipment. Miller & Levi, 46 Cornhill Street, are architects.

The Norwood Engineering Co., 200 Dartmouth Street, Boston, has acquired a controlling interest in the Mayhew Steel Products Co., Inc., Shelburne Falls, Mass., manufacturer of tools, drills, etc., and will maintain operations as heretofore. Expansion plans are under consideration.

The International Paper Co., 100 East Forty-second Street, New York, is reported to be planning the construction of a new mill in the vicinity of Fort Kent, Me., to include a hydroelectric power development at Fish River Falls. The entire cost is estimated in excess of $1,000,000.

The City Hall Hardware Co., 150 Washington Street, Providence, R. I., has plans for a new six-story factory, 96 x 100 ft., to cost about $200,000 with equipment. T. J. Pierce, 275 Washington Street, is architect.

The Hartford Electric Light Co., Hartford, Conn., is arranging for an increase in capital from $16,000,000 to $20,000,000, a portion of the proceeds to be used for expansion. Plans have been authorized for an addition to the South Meadow steam-operated electric generating plant, to include the installation of turbo-generators, condensers, boilers, and auxiliary equipment. Stone & Webster, Inc., 49 Federal Street, is engineer. Townsend W. Soren, vice-president, will be in charge of engineering work.

F. N. Tilton, care of the American Screw Co., 85 Charter Avenue, Hartford, Conn., is at the head of a project to construct a two-story automobile service, repair and garage building, to cost approximately $100,000.

The City Council, Bristol, Conn., is considering the installation of an electric-operated pumping plant in connection with a sewage disposal system in the Forestville district. Carleton Buell is city engineer.

Ralph Testa, 142 St. Andrew Road, Boston, architect, has plans for a one-story automobile service, repair and garage building, 90 x 225 ft., at Somerville, Mass., to cost about $100,000 with equipment.

Chicago

CHICAGO, Feb. 14.

ORDERS for individual machine tools are more numerous in the local market, but fresh inquiry is light and gives little promise for the near future. Several Western railroads are actively at work on their requirements, and it is reported that the Northern Pacific soon will offer its list to the trade. This railroad has purchased a Putnam 90-in. journal turning, quartering and pin turning machine from Manning, Maxwell & Moore, Inc. The St. Paul has closed for a 20-ft. horizontal frog and switch drilling machine, two 16-in. lathes, two 28-in. shapers and a drill press, and will buy a 5-ft. and a 6-ft. radial drill. The Barber-Colman Co., Rockford, Ill., has placed a No. 3 vertical milling machine, and the Crane Co., Chicago, has bought a 16-in. lathe. Reports indicate that the Illinois Steel Co.'s list, issued last week, may not be closed before late summer or early fall.

Deere & Co., Moline, Ill., are having plans prepared for a factory addition to cost $250,000.

The City Council, Jewell, Iowa, is arranging for extensions and improvements to its municipal waterworks, including a 100-gal. per min. capacity pumping unit and a 75,000-gal. elevated tank and tower. The Henningson Engineering Co., National Building, Omaha, Neb., is engineer.

The Johnson Sheet-Metal Works, Albert Lea, Minn., has started the erection of a new sheet metal shop.

The Chicago Tube & Iron Co., 2531 West Forty-eighth Street, Chicago, has awarded a general contract to McKeown Brothers, 112 West Adams Street, for a one-story addition, 42 x 60 ft.

The North Continent Utilities Corporation, Elk River, Minn., operating the Elk River Power & Light Co.; Denver Ice & Cold Storage Co., Denver, Colo., and other properties, is disposing of a bond issue of $2,000,000, a portion of the proceeds to be used for extensions and for a controlling interest in a utility company at Waukegan, Ill. It is proposed to build an artificial gas plant and coke works at the latter place.

The Three Forks Portland Cement Co., Ideal Building, Denver, Colo., is said to be planning extensions and improvements in its mills at Hanover and Trident, Mont. The work will include the construction of an electric traction line between the mill and quarry, about 4½ miles. The entire project will cost approximately $250,000.

The reference in the last issue of THE IRON AGE to the proposed municipal electric light and power plant at Eagle Falls, Iowa, is a project of the city of Eagle Grove, Iowa. The installation is estimated to cost $125,000.

The Northern Pacific Railway Co., Railway Building, St. Paul, Minn., is said to have plans under way for a new one-story car shop at Laurel, Mont., 100 x 250 ft., to cost about $275,000. Bids are expected to be asked on a general

The Crane Market

WHILE there is only a small volume of inquiry for electric overhead cranes, interest in hand power and small overhead equipment as well as locomotive cranes is increasing. In used locomotive cranes, particularly, there are a number of active inquiries. In the past week a large paper company is reported to have closed on a bucket handling crane for a plant in Maine. In the St. Louis territory, the St. Louis municipal waterworks will open bids, Feb. 18, on two 20-ton, 3-motor overhead cranes for the Howard's Bend plant.

In the Pittsburgh district, the Weirton Steel Co., Weirton, W. Va., is in the market for an open-hearth, cinder-handling, double trolley crane. One trolley is to be of 25 tons capacity with 10-ton auxiliary hoist and the other of 15 tons capacity with grab bucket.

Among recent purchases are:

Jones & Laughlin Steel Corporation, Pittsburgh, a 10-ton, 6-motor, ingot-handling crane, with 10-ton auxiliary, a 10-ton ingot-handling crane, a 10-ton revolving transfer trolley and a 60-ton trolley with 20-ton auxiliary hoist, from the Alliance Machine Co.

Norfolk & Western Railroad, Norfolk, Va., a 35-ton locomotive crane from the Industrial Works and three 25-ton locomotive cranes and three standard railroad ditchers, from the American Hoist & Derrick Co.

Herbert Bryant's Sons, Alexandria, Va., a 15-ton, 8-wheel standard locomotive crane from the American Hoist & Derrick Co.

Rochester Gas & Electric Co., Rochester, N. Y., a 75-ton, 33-ft. span, 3-motor overhead crane from the Niles Crane Corporation.

Continental Can Co., Corwith, Iowa, a 10-ton, 80-ft. span, 3-motor overhead crane from the Shaw Electric Crane Co.

Viscose Co., Philadelphia, a 22-ton, 8-wheel, standard gage locomotive crane from the Orton Crane & Shovel Co.

Brewer & Brewer Sons, Chillicothe, Ohio, a ½-cu. yd. bucket crane through Thaleg & Hock, Inc., Chicago, from the Bergan Schmidt Co., Champaign, Ill.

Chicago, Milwaukee & St. Paul Railroad, a 1¾-ton magnet handling crane for the Dubuque, Iowa, terminal, through Thaleg & Hock, Inc., from the Bergan Schmidt Co.

Thomas Moulding Brick Co., Chicago, a ½-cu. yd. bucket crane through Thaleg & Hock, Inc., from the Bergan Schmidt Co.

Inland Steel Co., Indiana Harbor, Ind., a ½-cu. yd. bucket crane through Thaleg & Hock, Inc., from the Bergan Schmidt Co.

Florida Portland Cement Co., Tampa, Fla., two 7½-ton overhead cranes and a 20-ton overhead crane from the Whiting Corporation.

contract late in the spring. O. M. Rognan is company architect.

L. E. Kroman, 134 North La Salle Street, Chicago, architect, will soon begin the construction of a three-story automobile service, repair and garage building, 104 x 215 ft., to cost about $300,000.

The Northwestern Public Service Co., Aberdeen, S. D., has arranged for a bond issue of $5,800,000, a portion of the proceeds to be used for extensions and improvements. Harry Reid is president.

The Wabash Railway Co., Railway Exchange Building, St. Louis, is said to have plans under way for rebuilding its car and locomotive shops at Springfield, Ill., recently damaged by fire. The new structure will be 90 x 300 ft., to cost about $180,000 with equipment.

The Baker Mfg. Co., Harvard Park, Springfield, Ill., manufacturer of road machinery, is said to be planning a one-story addition, to cost close to $50,000, with equipment. E. E. Staley is president.

The Harper Refining Co., 15 North River Street, Aurora, Ill., will soon begin the erection of a one-story oil storage and distributing plant, 100 x 100 ft., at Elgin, Ill., to cost $55,000 with equipment. H. E. Spieler, Graham Building, is architect. Charles W. Harper is president.

The National Lead Battery Co., 1728 Roblyn Avenue, St. Paul, Minn., is reported to be planning the construction of a new plant in the vicinity of Newark, S. D., to cost more than $200,000 with equipment. Bids will be asked on a general contract late in the spring.

Philadelphia

PHILADELPHIA, Feb. 14.

IN connection with the proposed electrification of portions of its New York division, the Pennsylvania Railroad Co., Philadelphia, is planning for the construction of a steam-operated electric generating station near Trenton, N. J., to cost in excess of $30,000,000 with transmission system. The Philadelphia Rapid Transit Co. and the United Gas Improvement Co., Broad and Arch Streets, Philadelphia, are interested in the project, and it is said that Arthur W. Thompson, president of the last noted company, will be in charge of the enterprise.

The Board of Trustees, University of Pennsylvania, Philadelphia, has awarded a general contract to Monaghan & Losse, 3016 Chestnut Street, for a one-story and basement machine shop, 40 x 97 ft., to cost about $35,000.

The Keystone Auto Top & Body Co., 1420 Fairmount Avenue, Philadelphia, has leased a new building at 2325-31 Fairmount Avenue, where it will remove the present works and increase the capacity.

The Allen Corporation, 309 South Fifteenth Street, Philadelphia, manufacturer of calculating machines, is continuing its expansion program and has acquired the Peters-Morse Mfg. Corporation, Ithaca, N. Y., manufacturer of similar equipment. The Ithaca plant, it is stated, will be continued for the manufacture of the Peters adding machine, as well as for the production in part of the Allen calculator and the Wales line of visible adding machines, recently secured through the purchase of the Wales Adding Machine Co., Wilkes-Barre, Pa. The company plans an increase in production in all of these lines. It is purposed to remove the general offices to the building at 233-45 Spring Street, New York, lately taken over. Ralph C. Allen is president.

The Acme Wire Co., Philadelphia, has leased about 25,000 sq. ft. in the building at 404-12 Brown Street and will install equipment for the operation of a plant.

The City Council, Allentown, Pa., is considering the installation of pumping machinery and other power equipment in connection with proposed extensions and improvements in the sewage system, for which an appropriation of $2,500,000 has been authorized. A sewage treatment plant will be installed.

The Haddock Mining Co., Miners Bank Building, Wilkes-Barre, Pa., has tentative plans for the installation of a new coal breaker in the vicinity of McCann's Hill, between Port Carbon and Pottsville, where coal property recently has been secured. The proposed plant will be equipped to handle about 400 tons per day and will cost in excess of $150,000. The company will make extensions in its colliery at Silver Brook, Pa.

The Norristown School District, Norristown, Pa., plans the installation of manual training equipment in its proposed new junior high school, to cost in excess of $200,000, for which bids are being asked on a general contract until Feb. 25. Ritter & Shay, Packard Building, Philadelphia, are architects.

Sears, Roebuck & Co., Chicago, manufacturers of portable houses, agricultural implements, etc., have concluded arrangements for the purchase of 3½ acres at Civic Center, Camden, N. J., as a site for a proposed storage and distributing plant to cost $1,000,000. It is purposed to have the structure ready for service in the fall.

The Victor Talking Machine Co., Camden, N. J., has approved plans for its English subsidiary, known as the Gramophone Co., Ltd., with plant at Hayes, Middlesex, England. The work will include an addition to the Hayes factory to cost about $750,000 with equipment. The extension will be given over to cabinet-making and other manufacture, and the erection of a new plant unit at Calcutta, India, reported to cost more than $300,000. Walter J. Staats is vice-president of the Victor company, in charge of foreign business.

The Eckhardt Corporation, Philadelphia, manufacturer of radio equipment, has leased a portion of the building at Fifty-fifth and Hunter Streets for a new plant.

The Board of Education, Wilkes-Barre, Pa., is considering the installation of manual training equipment in a proposed three-story high school to cost about $250,000, for which plans will be drawn by R. Ireland, Wilkes-Barre, architect.

Cleveland

CLEVELAND, Feb. 14.

FOLLOWING an active market for several days, machine tool sales fell off sharply the past week, and the volume of business entered was lighter than for some time. Inquiries have also slowed up, but the volume of new inquiry is better than sales. A considerable part of the prospective business is dragging. Some business is in prospect from Detroit automobile companies, but this is slow in coming to a head. Except for an occasional single tool, no orders are coming from the railroads in this territory. According to present indications, aggregate sales this month will be less than in January.

The Atlas Wire Works, Cleveland, has purchased the former plant of the Cornwall Co., local, which it will remodel. The erection of an addition is also planned.

The Dearborn Mfg. Co., 3109 Detroit Avenue, Cleveland, has moved to new quarters at 1477 West 110th Street. The company is engaged in machine work.

The Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of industrial oxygen, acetylene welding apparatus, etc., has asked bids on general contract for a proposed plant at Buckeye Street and the line of the Ann Arbor Railway, Toledo, Ohio, to cost $150,000, with equipment.

The Board of Education, Hudson Township, Hudson, Ohio, is considering the installation of manual training equipment in a proposed two-story and basement junior high school, to cost $200,000, for which bids are being asked on a general contract. Miller & Sons, Dollar Bank Building, Youngstown, Ohio, are architects.

The Patterson Foundry & Machine Co., Walnut Street, East Liverpool, Ohio, has acquired a tract of five acres in the East End section as a site for a new plant, to cost in excess of $175,000 with equipment. It is purposed to begin work in March. The present plant will be removed to the new location and expanded. R. L. Cawood is president.

Buffalo

BUFFALO, Feb. 14.

PLANS have been authorized by the Upton Cold Storage Co., 38 Cliff Street, Rochester, N. Y., for rebuilding its cold storage and refrigerating plant, recently destroyed by fire. It is estimated to cost in excess of $1,000,000 with equipment. Herbert B. Cash is president.

Remington-Rand, Inc., is being organized by officials of the Remington Typewriter Co., 374 Broadway, New York, and the Rand Kardex Bureau, Inc., Tonawanda, N. Y., to take over and consolidate the two interests. The merger will include, also, the Dalton Adding Machine Co., Cincinnati, and the Baker-Vawter Ledger Co., Benton Harbor, Mich. The Rand Kardex Bureau, Inc., specializes in the production of office filing and visible index equipment, and is now having plans drawn for an addition to its plant at Niagara Falls, Ont., to cost more than $150,000 with equipment. Benjamin L. Winchell, president of the Remington company, will be chairman of the board of the new organization, and James H. Rand, Jr., president.

The Board of Education of the Union Free School District No. 9, Lennox, N. Y., Charles Hoffman, Canastota, N. Y., in charge, is considering the installation of manual training equipment in its proposed new high school at Lennox, estimated to cost $175,000, for which bids have been asked on a general contract. E. Hallenbeck, Slocum Hall, Syracuse University, Syracuse, N. Y., is architect.

Fire, Feb. 7, damaged a portion of the plant of the Whistler Machine & Tool Co., Buffalo, occupying leased building at 1283 Niagara Street, with loss reported at close to $18,000 including equipment.

The Smith & Caffrey Co., 2613 Lodi Street, Syracuse, N. Y., manufacturer of iron castings, has awarded a general contract to Jenks & Venton, local, for a one-story addition, 40 x 100 ft. Improvements will be made also in the present foundry.

Henry Schaefer, 416 Main Street, Dunkirk, N. Y., and associates are preparing plans for a three-story automobile service, repair and garage building, 80 x 140 ft., to cost close to $100,000 with equipment. G. Eichenhaub, Commerce Building, Erie, Pa., is architect.

The Wright-Hargreaves Mines, Ltd., Lafayette Building, Buffalo, has approved plans for a new mill at its gold-mining properties at Kirkland Lake, Ont., to be equipped for an ore-handling capacity of close to 200 tons per day. It is purposed to have the plant ready for service late in the present year. The company also plans the installation of additional hoisting, drilling and other equipment, and ore-handling machinery.

The Board of Education, 133 Forest Avenue, Jamestown, N. Y., expects to ask bids early in March for a proposed junior high school, with manual training department, estimated to cost $400,000. Guilbert & Betelle, Chamber of Commerce Building, Newark, N. J., are architects.

The Rome Brass & Copper Co., Rome, N. Y., is planning the erection of an addition to its plant at Riverdale to contain 160,000 sq. ft. of floor space.

Gulf States

BIRMINGHAM, Feb. 14.

PLANS have been filed by the San Antonio Machine & Supply Co., 102 South Chaparral Street, Corpus Christi, Tex., for a one-story addition, 100 x 140 ft., to cost $25,000 with equipment.

The Weslaco Automobile Co., Weslaco, Tex., has plans for a two-story service, repair and garage building, to cost about $75,000 with equipment. Ralph H. Cameron, City National Bank Building, San Antonio, Tex., is architect.

The Southern Lime Products Co., Cincinnati, has leased the plant of the Alabama Lime Works, Fort Payne, Ala., idle for about three years. Improvements will be made and additional equipment installed.

Ovens, power equipment, conveying and other machinery will be installed in the new two-story plant, 140 x 200 ft., to be erected by the Fehr Baking Co., 1919 Comal Street, San Antonio, Tex., estimated to cost $140,000, for which foundations will soon be laid.

The Alabama Power Co., Birmingham, is said to have preliminary plans for a new automatic power substation at East Albany, Ala., to cost close to $200,000 with equipment.

The Panhandle Sash & Door Co., Grant and Eleventh Streets, Amarillo, Tex., is reported to be planning the construction of a new factory, with portion for storage and distributing service, to cost $90,000 with equipment.

The San Antonio Cotton Oil Co., 411 North Cherry Street, San Antonio, Tex., has awarded a general contract to the McKenzie Construction Co., Travis Building, for a two-story and basement plant, 45 x 190 ft., to cost about $45,000 with equipment. Richard V. Stratten, Travis Building, is architect.

The Board of Education, Lakeland, Fla., is said to be planning the installation of manual training equipment in its new two-story high school, to cost $250,000, on which work is under way.

The Southwestern Seating Co., 813 South Presa Street, San Antonio, Tex., is planning the purchase of sanding machines and other equipment.

The Florida Power & Light Co., Civic Building, Miami, Fla., has plans for a new two-story ice-manufacturing plant at Palatka, Fla., with capacity of 80 tons per day, to cost about $65,000. The work will be in charge of the Phoenix Utility Co., 71 Broadway, New York.

In connection with an expansion program in 1927 to cost about $1,000,000, the El Paso Electric Co., El Paso, Tex., will expend about $550,000 for enlargements in its local steam-operated electric generating plant, with installation of high-pressure boiler units and other equipment. Close to $100,000 will be used for extensions and improvements in substations and lines. The company is operated by Stone & Webster, Inc., 49 Federal Street, Boston.

The Alamo Steel & Supply Co., Spring and Taylor Streets, Houston, Tex., distributer of contractors' machinery, will proceed with a new storage and distributing plant to cost about $40,000. J. W. Lawson is general manager.

The Board of Education, San Angelo, Tex., is said to be planning the installation of a vocational department in its two-story junior college to cost about $250,000, for which bids will soon be asked on a general contract. Phelps & Dewees, Gunter Building, are architects.

G. W. Gogeshall, San Antonio, Tex., is at the head of a project to construct and operate an ice-manufacturing plant at Houston, Tex., where site, 120 x 160 ft., has been secured. It will cost about $80,000 with equipment.

The Mississippi Power & Light Co., Jackson, Miss., is arranging a construction and improvement program in 1927 to cost about $3,000,000, including transmission lines, etc.

John C. Crossland, head of the Miami Fish & Ice Co., 63 S. W. Sixth Street, Miami, Fla., is interested in a project to construct and operate a cold storage and refrigerating plant. Two structures will be erected, each one story, 100 x 350 ft., and 70 x 300 ft., with Diesel engine power plant. The plant is expected to cost close to $300,000 with equipment.

The Texas Tie & Lumber Co., 1358 Harrison Street, Beaumont, Tex., is planning the installation of additional equipment, including swinging cut-off saw, two-saw edging machine, sawmill, circular saw, conveying equipment, etc. It is planned, also, to purchase a 75-hp. engine.

The Valley Electric & Ice Co., San Benito, Tex., is said to be arranging an expansion program in 1927 to cost about $3,000,000, including extensions and betterments in power plants, in ice-manufacturing plants, etc.

Pittsburgh

PITTSBURGH, Feb. 14.

FAIRLY good demand for machinery is noted from fabricators of sheet metal, but general maintenance and machine shop inquiry is slow. Several machine tools will soon be wanted by the Standard Seamless Tube Co., Economy, Pa., to replace those recently damaged or destroyed by fire.

The Aluminum Co. of America, Inc., Oliver Building, Pittsburgh, is disposing of a bond issue of $60,000,000, a portion of the fund to be used for a construction program in 1927, including the building of hydroelectric generating plants at Santeetlah and Badin, N. C., and the completion of its new aluminum works at Arvida, Quebec, now under way, at a cost of approximately $10,000,000.

The Price Electric Co., 430 Penn Avenue, Pittsburgh, manufacturer of electrical supplies, etc., is said to be considering the erection of a new plant.

Fire, Feb. 5, destroyed a portion of the plant, including machine shops and electrical department, of the Standard Seamless Tube Co., Economy, Pa., with loss reported at more than $350,000 including equipment.

The Connellsville Mfg. Co., Connellsville, Pa., manufacturer of mining equipment, etc., will proceed with a new one-story plant, 130 x 240 ft., for which a general contract recently was let to the Austin Co., Pittsburgh, to cost more than $75,000 with equipment.

The Board of Education, Masontown, Pa., is considering the installation of manual training equipment in a proposed two-story senior and junior high school to cost $200,000, for which plans are being drawn by H. W. Altman, Fayette Title & Trust Building, Uniontown, Pa., architect.

The City Council, Oil City, Pa., is planning the installation of electrically operated pumping machinery at the municipal waterworks.

The Penn Central Light & Power Co., Altoona, Pa., will build a new gas-generating plant at Lewistown, Pa., to cost $500,000, including boilers, pumping units and other equipment.

The Parkersburg Rig & Reel Co., Parkersburg, W. Va., says that the item printed on page 404 of the issue of Feb. 10 respecting the award of the contract for the construction of a branch plant at Casper, Wyo., was not correct.

South Atlantic States

BALTIMORE, Feb. 14.

THE Continental Roofing & Mfg. Co., 1200 South Sixteenth Street, Baltimore, has filed plans for a one-story addition, 70 x 100 ft., to cost $35,000 with equipment.

The Board of District Commissioners, District Building, Washington, is asking bids until Feb. 25 for one gasoline engine-driven portable air compressor unit.

The Neill-Buick Co., Sisson Drive, near Twenty-sixth Street, Baltimore, has awarded a general contract to the Consolidated Engineering Co., 20 West Franklin Street, for a three-story service, repair and garage building, 80 x 160 ft., to cost $100,000. Charles M. Anderson, 9 East Pleasant Street, is architect.

The Town Council, Waynesboro, Va., is considering the installation of pumping equipment in connection with proposed extensions in the municipal waterworks in the Baker Springs district.

The Hogge Battery Assembling Co., 3507 O'Donnell Street, Baltimore, is planning the installation of additional equipment, including a grid molder for production of battery plates.

Emerson & Orme, 1620 M Street, N. W., Washington, local representatives for the Buick automobile, have awarded a general contract to the Charles H. Tompkins Co., 1612 Park Road, for a four-story addition, 105 x 135 ft., estimated to cost $250,000 with equipment. Appleton P. Clark, Jr., 816 Fourteenth Street, N. W., is architect.

The Delaware Motor Sales Co., Eleventh and King Streets, Wilmington, Del., has filed plans for a three-story service, repair and garage building to cost about $90,000 with equipment. The general contract recently was let to W. E. Booth & Son, Salisbury, Md.

The Board of City Commissioners, Leesburg, Va., is considering the construction of a municipal ice-manufacturing plant estimated to cost $50,000 with machinery. A bond issue will be arranged.

The Packard Motor Car Co., 302 Spring Street, Atlanta, Ga., has awarded a general contract to the Southern Ferro-Concrete Co., 509 East Ellis Street, for its proposed new service, repair and garage building, 80 x 224 ft., to cost approximately $125,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect. R. C. Snow, Bona Allen Building, Atlanta, is associate architect.

The Prince George Electric & Power Co., Petersburg, Va., is considering plans for a new steam-operated electric power plant, using Diesel engine units, reported to cost about $60,000.

The High Point Machine Works, High Point, N. C., is in the market for two electric generators, 200 and 250 kw. respectively, belt driven, with exciters and accessories; also for a 150-hp. high pressure horizontal return tubular boiler.

The Southern Cotton Oil Co., Lathrop Building, Savannah, Ga., is said to be arranging for extensions and improvements in its storage and distributing plant to increase the capacity from 80,000 to 200,000 bbl., to cost in excess of $75,000.

C. V. Abbott, Brunswick, Ga., is at the head of a project to construct and operate a one-story ice-manufacturing plant with output of about 25 tons per day.

Cincinnati

CINCINNATI, Feb. 14.

LOCAL machine tool builders report that sales the past week have been only fair at best. While the number of inquiries before the trade lends encouragement, prospective purchasers are slow in closing for equipment. Meager orders from the automotive industry have been partly responsible for the failure of bookings to come up to expectations. Most of the business placed in the past 10 days has been by companies in the general industrial field, and with few exceptions sales have been confined to single machines. Machine tool executives anticipate an improvement in the next two weeks, and despite the apparent lack of interest on the part of many buyers, the volume of orders in February is expected to equal, and possibly exceed, that in January. Local plants are operating at a fair rate.

The Clifton Machinery Co., 1224 West Eighth Street, Cincinnati, is in the market for two 90-in. or 120-in. Schwartz furnaces, or equivalents, with Spencer turbine blowers to suit.

The Brinkman Engineering Co., Dayton, Ohio, manufacturer of tools and dies, has sold its one-story factory at Third and Montgomery Streets and has leased 5000 sq. ft. of space in a building at Bacon and Bainbridge Streets. William Roehm is president.

Contract has been let by the Columbus Auto Parts Co., 215 Russell Street, Columbus, Ohio, to the Boldt-Rapp Co., local, for extensions and improvements in its one-story plant to cost $27,000.

Permit has been issued to the Goldsmith Metal Lath Co., Third and Eggleston Streets, Cincinnati, for its one-story plant for metal fabricating service. It will cost about $75,000. G. W. Drach, Cincinnati, is architect.

The International Agricultural Corporation, Mutual Life Building, Buffalo, has begun the erection of its new phosphate grinding mill near Wales, Tenn., to cost about $150,000. Equipment will be provided for crushing and pulverizing raw phosphate from the company's mines in this section.

The Lummus Cotton Gin Co., Columbus, Ga., manufacturer of cotton-ginning machinery, has awarded a general contract to F. J. Ozanne & Co., Empire Building, Memphis, Tenn., for its one-story factory branch and distributing plant at Memphis, to cost close to $50,000 with equipment. Charles F. Hichman, Swift Building, Columbus, is architect.

The New York Central Railroad Co., Grand Central Terminal, New York, has awarded a general contract to the Newton & Baxter Co., 417 Hamilton Street, Toledo, Ohio, for its car repair shop at Toledo, to cost in excess of $75,000.

Ovens, power equipment, conveying and other machinery will be installed in the two-story and basement plant, 135

x 155 ft., to be erected by Swan Brothers, Inc., 810 North Central Street, Knoxville, Tenn., to cost $150,000. Baumann & Baumann, 813 Market Street, are architects.

The Illinois Central Railroad Co., Chicago, has awarded a general contract to Joseph E. Nelson & Sons, 1500 Kentucky Avenue, Paducah, Ky., for the construction of four additional one-story units at its local shops, including wheel works, mill and structural building, and wood-working shop. The cost is stated in excess of $175,000 with equipment.

The Ninth Street Garage Co., 3131 Fairfield Avenue, Cincinnati, has awarded a general contract to Roos-Meyer-Hecht, Inc., Stanton Avenue, for its seven-story service, repair and garage building, 100 x 400 ft., to cost close to $300,000 with equipment.

The Board of Trustees, Miami University, Oxford, Ohio, contemplates the construction of a one-story mechanical shop and one-story service works, estimated to cost $50,000 with equipment. R. M. Hughes is president.

The Winchester Sand & Gravel Co., Winchester, Ky., is considering the purchase of crushing and pulverizing equipment and sand-washing apparatus. H. C. MacNeill is secretary.

St. Louis

ST. LOUIS, Feb. 14.

CONTRACT has been let by the Koken Companies, Inc., 2528 Texas Avenue, St. Louis, manufacturer of enameled iron barber chairs and kindred equipment, to the W. H. Cunliff Construction Co., local, for four one-story additions, 190 x 530 ft., 115 x 280 ft., 100 x 160 ft., and 40 x 54 ft., to cost about $130,000 with equipment. Manske & Bartling, 410 North Euclid Street, are architects. Walter F. Koken is president.

The Hinderliter Tool Co., North Madison Street, Tulsa, Okla., manufacturer of oil well drilling tools and machinery, is completing plans for the erection of a new plant on 10-acre tract recently purchased. The initial units will be one story, 150 x 300 ft., and 150 x 160 ft., respectively, designed to double the present output. Several electric cranes will be installed in addition to other equipment. The project will cost in excess of $500,000 with machinery.

The Warrior Ice Co., Warrior, Ark., will erect a new one-story ice-manufacturing plant to cost about $35,000 with equipment.

Bids will soon be asked by the City Council, Fremont, Neb., for extensions and improvements in the municipal electric power plant, including the installation of additional equipment, to cost $150,000. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

The Pine Bluff Heading Co., East Sixth Street, Pine Bluff, Ark., has begun the erection of a new one-story hardwood mill, to cost close to $40,000 with equipment.

Davis & Wilson, 525 South Thirteenth Street, Lincoln, Neb., architects, are preparing plans for a three-story and basement automobile service, repair and garage building, to cost approximately $100,000 with equipment.

The Rockwell Ice & Storage Co., Camden, Ark., recently organized, plans the construction of a one-story ice-manufacturing and cold storage plant to cost about $40,000. W. J. Risinger is vice-president.

Indiana

INDIANAPOLIS, Feb. 14.

BIDS will be asked early in the summer by the Adams & Westlake Co., 319 West Ontario Street, Chicago, manufacturer of locomotive headlights, automobile headlights, etc., for a new plant at Elkhart, Ind., to cost about $350,000 with equipment. Mundy & Jensen, 39 South La Salle Street, Chicago, are architects. Thomas W. Holt is general manager.

Myrle E. Smith, 323 South Main Street, South Bend, Ind., architect, has filed plans for a three-story and basement automobile service, repair and garage building, 65 x 165 ft., to cost close to $100,000 with equipment.

Blazek & Co., Inc., Peru, Ind., manufacturer of furniture, is said to be arranging to rebuild the portion of its plant recently destroyed by fire, with loss close to $100,000 with machinery.

The Duesenberg Motors Co., 1511 West Washington Street, Indianapolis, manufacturer of automobiles, has asked bids on a general contract for a one-story addition, 72 x 320 ft., to cost approximately $100,000 with machinery. C. L. Cord is president.

The S. F. Bowser Co., Inc., Fort Wayne, Ind., manufacturer of gasoline pumping equipment, oil tanks, etc., is said to be planning enlargements in its factory branch at San Antonio, Tex., and the installation of additional equipment.

The Royal Metal Mfg. Co., 2318 South Western Avenue, Chicago, manufacturer of metal furniture, wire products, etc., has awarded a general contract to the Tonn & Blank Co., 1021 West Ninth Street, Michigan City, Ind., for its new plant at Michigan City, estimated to cost $75,000.

The Harter Industrial District, Hammond, Ind., developing a new industrial section, has plans for a central power house for service at several new factories to be erected, to cost about $50,000. A tract of 15 acres has been taken over. Charles Retz is general manager.

The Thornburg & Lewis Motor Car Co., 3839 East Washington Street, Indianapolis, will take bids at once for a new two-story and basement service, repair and sales building, 90 x 130 ft., to cost $70,000 exclusive of equipment. Doeppers & Lennox, 226 East Michigan Street, are architects.

In addition to a new one-story foundry, for which general contract recently was let, the Universal Brass Works, 139 South East Street, Indianapolis, is said to have plans for another one-story addition, 70 x 105 ft., to be equipped as a plating works and machine shop. Bids are expected to be asked late in the spring.

The Wadley Co., 615 South Sixth Street, Terre Haute, Ind., will erect a cold storage and refrigerating plant, 90 x 92 ft., to cost $100,000 with equipment. George Lehle, 3810 Broadway, Chicago, is architect.

Detroit

DETROIT, Feb. 14.

PLANS have been filed by the Leonard Refrigerator Co., Grand Rapids, Mich., for two additions, each three stories and basement, 130 x 235 ft., and 90 x 150 ft. respectively, to cost $200,000, for which contract has been let to the Austin Co. The company is a subsidiary of the Electric Refrigeration Corporation, Detroit.

The Driggs Aircraft Corporation, Dayton, Ohio, is said to have concluded arrangements for the acquisition of a portion of the plant of the Auto Body Co., Lansing, Mich., now in receivership, and plans for the removal of its business to this location, where additional equipment will be provided. It is proposed to develop mass production for a small size commercial airplane.

The Heifley Plumbing Co., Battle Creek, Mich., plumbing and heating equipment, will take bids soon for a new one-story storage and distributing plant, 66 x 135 ft., with pipe-cutting and threading department and mechanical shop, estimated to cost $30,000. Benjamin & Benjamin, Wenham Building, are architects.

The Citizens Gas Fuel Co., Adrian, Mich., has arranged a construction and improvement program to cost about $200,000, including the installation of additional equipment in generating station.

The Board of Education, Rogers City, Mich., is considering the installation of manual training equipment in a proposed two-story high school to cost $225,000, for which it is expected to ask bids on a general contract in March. R. V. Gay, St. Johns, Mich., is architect.

The Detroit Brass & Malleable Works, Holden Avenue, Detroit, is completing plans for a one-story addition to its factory at Wyandotte, Mich., to cost in excess of $25,000. Harry S. Angell, Detroit, is architect.

The Department of Public Works, City Hall, Detroit, is planning the installation of an emergency pumping plant for the municipal waterworks, estimated to cost $500,000. It is proposed to construct, also, a new central power plant for heating service to cost about $375,000. A budget of $4,300,000 is being arranged for the operation of the water plants and expansion during 1927.

The Oakland Motor Car Co., Pontiac, Mich., will carry out an expansion and betterment program during the year to cost about $5,000,000. The work will include three new plant units and power house in the vicinity of the present Oakland works.

The Board of Education, Ferndale, Mich., is considering the installation of manual training equipment in a proposed two-story junior high school to cost $175,000, for which plans will soon be completed. It is expected to ask bids in March. H. T. Keyes, 155 West Congress Street, Detroit, is architect.

The Briggs Mfg. Co., 11631 Mack Avenue, Detroit, manufacturer of automobile bodies, has taken over the plant and business of La Baron, Inc., Bridgeport, Conn., manufacturer of custom motor car bodies, and will consolidate with its organization. It is understood that the Bridgeport works will be continued in service. Walter O. Briggs is chairman of the board of the purchasing company, and John H. French, president.

Milwaukee

MILWAUKEE, Feb. 14.

SALES of machine tools are of scattering character, but the volume is slowly expanding. No single industry can be specified as furnishing the largest quantity of orders, but automotive and railroad needs, judging by inquiries, give promise of predominating. Production schedules in foundries and machine shops are at about the 1926 average, and companies specializing in automotive work are again at normal capacity. Conditions generally show definite improvement.

The Kohler Co., Kohler, Sheboygan County, Wisconsin, manufacturer of enameled sanitary goods, etc., has awarded all contracts for the construction of a four-story shipping room building, 100 x 300 ft. Work is being put under way for doubling the capacity of the enameling shop at an estimated cost of $400,000. Walter J. Kohler is president.

The Schlueter Boiler Works, 320 North Main Street, Janesville, Wis., has plans for a proposed boiler and welding shop addition, 66 x 86 ft., one story and part basement.

D. Clabots, 501 North Main Street, Green Bay, Wis., is starting construction on a new wood products plant to replace the buildings destroyed by fire recently. Plans call for a main factory, 60 x 90 ft.; a planing mill, 30 x 70 ft., and a power house, 30 x 40 ft.

The Dunn County Board, Charles K. Averill, Menomonie, Wis., president, is taking bids for the construction of a $50,000 power house and laundry building at the County institutional group. It will be 72 x 100 ft., and requires two 60-in. x 16-ft. fire tube boilers, two feed pumps, a 120-ft. stack and other equipment.

The Milwaukee Printing Co., 181 Florida Street, Milwaukee, is taking bids for the construction of a $100,000 addition, four stories, 100 x 130 ft. Plans are by C. H. Tharinger and John P. Bruecker, associated architects, 496 Cramer Street, local.

The Prentiss-Wabers Products Co., Wisconsin Rapids, Wis., manufacturer of camp cookstoves, oil heaters and other sheet metal products, has increased its authorized capitalization from $100,000 to $200,000 with a view to enlarging its plant and output. Details have not been completed.

The Full-Crawler Co., 500 Clinton Street, Milwaukee, division of the George H. Smith Steel Casting Co., has changed its name to the Trackson Co. to better identify itself with the trademark of its product, the Trackson full-crawler attachment for Fordson tractors. The ownership, management and personnel remain unchanged.

Pacific Coast

SAN FRANCISCO, Feb. 9.

THE Post-Taylor Garage, Inc., San Francisco, has arranged with E. V. Lacey, Hearst Building, and associates for the erection of a four-story service, repair and garage building, to be occupied under lease. It will cost about $200,000 with equipment. O'Brien Brothers, 315 Montgomery Street, are architects.

The Valley Body & Radiator Works, 1830 H. Street, Fresno, Cal., has tentative plans for rebuilding its plant recently destroyed by fire, with loss at close to $100,000 with equipment.

The Angelus Furniture Mfg. Co., East Pico Street, Los Angeles, has filed plans for a new six-story factory, 175 x 200 ft., to cost about $250,000 with equipment.

The Community Ice Co., Hynes, Cal., recently formed by Robert Ord, head of the Ord Ice Co., Santa Barbara, Cal., and associates, is arranging the early construction of a one-story plant to cost about $35,000 with equipment.

The Los Angeles Gas & Electric Corporation, Los Angeles, has arranged for a bond issue of $10,000,000, a portion of the proceeds to be used for extensions and improvements.

A vocational shop will be constructed by the Board of Education, Riverside, Cal., at its proposed new central junior high school, to cost $325,000. Bids will be asked soon on a general contract. Marston, Van Pelt & Maybury, 25 South Euclid Avenue, Pasadena, Cal., are architects.

The Electric Products Corporation, Seattle, Wash., recently formed by H. F. Alexander, 1519 Railroad Street, and associates, is considering the early erection of a new plant for the manufacture of electric displays and illuminating devices, to cost about $225,000 with equipment.

The Aberdeen Plywood Co., Aberdeen, Wash., is completing plans for the erection of a new plant to cost approximately $175,000 with machinery.

The Salinas Cold Storage & Ice Co., Salinas, Cal., has preliminary plans for an addition and improvements in present plant, to cost $150,000 with equipment.

The Frances De Pauw Industrial School, 4952 Sunset Boulevard, Los Angeles, has acquired property at Sierra Madre, near Los Angeles, as site for a new industrial school, to cost more than $100,000 with equipment. Marston, Van Pelt & Maybury, 25 South Euclid Avenue, Pasadena, Cal., are architects.

Peter Helm, care of the Chamber of Commerce, Pittsburg, Cal., is at the head of a project to construct a one-story cold storage and refrigerating plant on land recently acquired, to cost about $40,000 with equipment.

The Crown King Mining Co., Mayer, Ariz., is said to be planning the construction of a new mill at its copper properties in the Bradshaw Mountain section, near Mayer, with capacity for handling 200 tons of ore daily. It is reported to cost more than $150,000 with equipment.

An expenditure of over $1,500,000 is planned for this year by the Southwestern Engineering Co., 1221 Hollingsworth Building, Los Angeles, for the construction of a new plant. The first unit, work on which will begin shortly, includes several steel buildings to cost over $600,000. The main structure will be 189 x 216 ft., with bay, 132 x 240 ft., and will contain machine shops, assembly, welding and other departments. Another building, 50 x 189 ft., will house the general offices, wood-working and carpenter shops. The third building, two stories, 32 x 82 ft., will be occupied by the laboratory and experimental engineering and drafting departments. A fourth building, 30 x 75 ft., will house the oil experimental laboratory and the oil research department. The structural steel for the plant has been awarded to the Baker Iron Works. The Union Iron Works will build a crane runway, 100 x 280 ft., which will contain one 30-ton and one 70-ton crane.

The Western Logging Machinery Co., Portland, Ore., H. L. Turney, president, has purchased the business of the Kaufman Tractor Co., 2230 First Avenue, South, Seattle, and will open offices and a warehouse in the latter city. The Kaufman company has been distributer for the Caterpillar Tractor Co., San Leandro, Cal., and this line has been taken over by the purchasing company. The Western Logging Machinery Co. will also become the Seattle representative of the Willamette Iron & Steel Works, Portland, and the Harnischfeger Sales Corporation, Milwaukee, distributing P and H gas and Diesel shovels to the logging industry of western Washington, wire rope, logging blocks and other equipment. The Seattle office of the Western Logging Machinery Co. will be in charge of J. A. Siegrist, formerly industrial representative of the Westinghouse Air Brake Co. in that city. Glenn Morris, for some years superintendent of construction and assembly, will join the Seattle office, specializing in the sale of Willamette equipment, and H. R. Fay, formerly with the sales department of the Kaufman Tractor Co., will continue in the same capacity with the new firm.

The Seattle-Astoria Iron Works, Seattle, maker of canning machinery, has purchased the business and equipment of the Pacific Closing Machine Co., Los Angeles, maker of a machine for sealing the tops of cans. This product hereafter will be made by the purchasing company in its Seattle plant.

The Austin Co., Dexter Horton Building, Seattle, will soon begin the erection of a one-story laundry, 60 x 122 ft., to cost about $150,000, which will be the first of 20 such plants to be built throughout the Pacific Northwest for the Superior Service Laundry Co., Inc., Tacoma, Wash.

The Pioneer Enameled Steel Products Corporation has begun operations in its new plant at 7784 Fourteenth Avenue, South, Seattle. It will make a full line of enameled steel parts. A. Jahns is president, Jacob Heib, vice-president, and F. J. Pohs, manager.

Canada

TORONTO, Feb. 14.

WITH prospects for early improvement in various lines of industrial activities, interest in the machine tool market continues active. Industrial plants are buying single tools for replacement, and there is a steady flow of inquiries from established plants and for new works. Dealers report a stronger demand from the mining districts of Ontario, and the extensive developments in the pulp and paper industry are also reflected in more active buying. The automotive industry is furnishing a better demand for tools, and it is expected that considerable business will develop from this source within the next few months.

The Carpenter Hixon Co., Ltd., subsidiary of the Shevlin-Clarke Co., which recently acquired the assets of the

McFadden Co. at Blind River, Ont., will start work on the erection of new mills there next spring.

The Eugene F. Phillips Electrical Works, Ltd., Brockville, Ont., will start work soon on the erection of an addition to its plant. It is expected that the company will erect a separate building to house its enameled wire department, and also a new mill to take care of cotton covering departments. Other improvements are also planned. Lawford Grant, Montreal, is managing director of the company.

The Eastern Rubber Co., Farnham, Que., is having plans prepared for the erection of a factory at Acton Vale, Que., to cost $30,000. A. Grise, Farnham, is architect.

Work will start immediately on a $15,000 addition to the plant of the Canada Metal Co., 39 Fraser Avenue, Toronto. F. S. Mallory, 364 Bay Street, is architect.

The Blue Quartz Gold Mines, Ltd., Confederation Life Building, Toronto, propose to start work in the spring on the erection of a new mill, with capacity of between 100 and 200 tons, at Painkiller Lake in northern Ontario.

The Happy Thought Foundry Co., Brantford, Ont., has purchased the buildings and equipment of the D. Moore Co., Hamilton, Ont. The Happy Thought Foundry Co. will increase its operations, and it is the intention to remove the machinery and patterns from the Hamilton plant to Brantford.

Western Canada

Plans are being prepared by the Crown Willamette Paper Co., San Francisco, for the erection of a pulp and paper mill at Campbell River on the east coast of Vancouver Island, B. C. The proposed work also covers the erection of a power plant to develop 100,000 hp.

The Canadian Rayon Pulp Co., Ltd., New Westminster, B. C., has been organized to build a rayon pulp mill on Poplar Island, B. C. J. Herb, president of the Westminster Paper Co., is also president of the new concern.

The City Council, Lethbridge, Alta., is contemplating an expenditure of $100,000 on extensions and improvements to the local power plant, including the installation of a new 3000-kw. turbogenerator.

The plant of the Richardson Road Machinery Co., Saskatoon, Sask., was destroyed by fire Feb. 6, with loss to buildings and equipment of $50,000.

The Winnipeg Electric Commission plans improvements and enlargements to the city and suburban systems, involving an immediate expenditure of $500,000 and another $500,000 will be spent later in the year. Tenders will be called at once for machinery and equipment for the first part of the project.

Foreign

THE Paulista Railways of Brazil, Rio Claro, are planning for the complete electrification of the line from Rio Claro to Rincao, about 177 miles, during 1927.

The Morris Motors Co., London, England, has acquired control of the plant and business of Wolsley Motors, Ltd., London, recently placed in receivership, and will operate the works for the manufacture of the Wolsley six-cylinder automobile. Expansion is planned. W. R. Morris is head.

The Swedish Chamber of Commerce in the United States, 25 Beaver Street, New York, has received an inquiry (Ref. 425) from a company in Sweden in the market for tin plate for can manufacture, 28 x 20, 112s, 216 lb. I. C.; also an inquiry (Ref. 461) from a company desiring to secure the rights of manufacture and sale of American wire-drawing machines in that country.

The Company Montecatini, Cotrone, Calabria, Italy, is planning for two new local plants, one to be equipped for the manufacture of aluminum salts, and the other for the production of aluminum. It is understood that the Italian Aluminum Co., Bussi, is interested in the enterprise. The American Consulate, Rome, Franklin C. Gowen, vice-consul, has information regarding the project.

The Imperial Government, Tokyo, Japan, is considering the early construction of two electric generating plants, with output to be used largely for railroad operation. The main station will be at Shinanogawa, and will be of hydroelectric type. An auxiliary steam-operated electric generating plant is planned at Tsurumi, with capacity of 60,000 kw. Work on the latter plant will begin first. The two stations are estimated to cost in excess of $8,000,000. The American Consulate, Tokyo, Harland L. Walters, vice-consul, has information regarding the project.

The International Railways of Central America, 17 Battery Place, New York, is disposing of a bond issue of $7,500,000, a portion of the fund to be used for the construction of about 197 miles of line in Guatemala and Salvador, including shop facilities, etc. It is expected to complete the work in 1928. Minor C. Keith is president.

The L'Office National Industriel d'Azote, Toulouse, France, is planning for expansion in its local nitrogen-fixation plant, to include the installation of a water-gas generating plant, with capacity of 160,000 cu. meters per 24 hr. Five generating units and accessory equipment will be provided.

The Government of Tasmania, Hobart, has plans under way for the construction of a new hydroelectric generating plant on the Shannon River Lake, estimated to cost close to $1,000,000 with machinery and transmission lines. It is proposed to have the station ready for operation in 1928. The American Consulate at Melbourne, Australia, Julian B. Foster, assistant trade commissioner, has information regarding the project.

The Fushun Collieries, Fushun, Fengtien Province, Japan, has plans for the installation of furnace equipment for shale oil distillation. It is proposed to install a battery of 48 40-ton furnaces and auxiliary equipment to cost in excess of $2,000,000, developing an estimated annual output of 25,000 tons. The work will include also the installation of by-products plants for the production of sulphate of ammonia, coal tar, etc. The American Consulate at Mukden, China, A. I. Ward, vice-consul, has information regarding the project.

Industrial Finances

The Crompton & Knowles Loom Works, Worcester, Mass., has reduced the par value of its shares from $100 to $25, and has split its 60,000 shares on a four and one basis. This step enables minor executives to increase their holdings. There is to be no public sale of stock.

The Allis-Chalmers Mfg. Co., Milwaukee, reports a net income for 1926 after Federal taxes and other charges of $3,596,891, equivalent after preferred dividends to $9.48 a share on the 260,000 shares of common stock outstanding. This compares with $3,417,368, or $8.78 a share in 1925. Unfilled orders, as of Dec. 31, 1926, amounted to $11,634,711, as compared with $10,147,072 at the close of 1925.

The Caterpillar Tractor Co., San Leandro, Cal., and its subsidiary, the Western Harvester Co., report consolidated earnings for 1926 before Federal taxes of $5,003,095, comparing with $4,457,560 in 1925. Total sales during the year amounted to $20,699,103, as compared with $20,859,842 in the previous year.

Net profits for 1926 of the American Steel Foundries, Chicago, after all charges and taxes, totaled $4,675,795, equal after preferred dividends to $4.50 a share on the common stock outstanding, and comparing with $4,669,737, or $4.48 a share in 1925.

The Koehring Co., Milwaukee, manufacturer of concrete mixers, paving outfits, gas power shovels, etc., has authorized an issue of $1,500,000 of 6 per cent gold notes, which have been underwritten by the Second Ward Securities Co. of Milwaukee. A total of $1,000,000 is being offered at this time, proceeds to be used to finance a larger volume of business. The notes are due serially in ten years. Sales of the Koehring Co. increased from $686,000 in 1917 to $3,097,000 in 1922 and $5,176,000 in 1926.

NEW TRADE PUBLICATIONS

Dynamometers.—General Electric Co., Schenectady, N. Y. GEA-544, dealing with the company's instrument for the accurate measurement of the torque or power principally on internal combustion engines.

Cutting-Off Tools.—Armstrong Brothers Tool Co., 317 North Francisco Avenue, Chicago. Leaflet briefly describing the company's new spring cutting-off tool, designed to eliminate chatter and prevent breaking of blades in lathe work.

Refractory Cement.—General Refractories Co., Philadelphia. Booklet describing the company's new Grefco chrome high temperature cement, designed for high resistance to metallurgical slags, fusible coal ash and other destructive materials. It is said to resist high furnace temperatures without shrinkage or deformation and to hold its bond at temperatures from 3400 to 3500 deg. Fahr.

Steam Drop Hammers.—Chambersburg Engineering Co., Chambersburg, Pa. Bulletin 205-B, having to do with the company's type B steam drop hammer and emphasizing certain improvements over previous models, particularly in the cylinders, frame and guide construction. The hammers are built in sizes with falling weights of 600 to 24,000 lb.

Hoisting Chain.—S. G. Taylor Chain Co., 140 South Dearborn Street, Chicago. Circular dealing with single and double sling or hoisting chain and its uses. Of particular interest is a table giving safe working loads on the different sizes of both single and double chains.

Shovels, Scoops, Etc.—Wood Shovel & Tool Co., Piqua, Ohio. Catalog C, containing descriptions, illustrations and specifications of the various types and sizes of shovels, scoops, spades and drainage tools manufactured by the company.

Machine Boiler Regulation.—Smooth Engineering Corporation, 136 Liberty Street, New York. Bulletin 31 dealing with the operation of pulverized coal fired boiler plants and the importance of machine regulation of coal, air and feed water on such installations. Charts are provided with full details of boiler regulation of this type and with considerable data of interest to power plant engineers.

Steam Turbo-Generators.—American Brown Boveri Electric Corporation, 165 Broadway, New York. Descriptive circular 100, 48 pages, illustrating with photographs and descriptive data the details of construction of the company's steam turbo-generators. Among the installations described is that at the United Electric Light & Power Co's Hell Gate station, said to be the largest in the world.

Cap and Set Screws.—Bristol Co., Waterbury, Conn. Bulletin 819, dealing with the company's safety cap and set screws of the dovetailed flute socket design. Various adaptations are included as well as tables furnishing data on standard dimensions of threads and special sizes which may be specified.

Wire Cloth.—Buffalo Wire Works Co., Inc., Buffalo, N. Y. Booklet providing information on the proper method of ordering wire cloth and also containing price list on the company's product, effective Jan. 1.

Centrifugal Pumps.—Wilson-Snyder Mfg. Co., Pittsburgh. Folder providing a diagram and brief description of centrifugal pumps for oil and gasoline. Some particular uses are cited.

Snow Loaders.—George Haiss Mfg. Co., Inc., 141st Street and Canal Place, New York. Brief folder describing a self-feeding snow loader, mounted on creeper tread and with a rated capacity of 8 to 10 cu. yd. per min.

Plug Tools.—Eclipse Interchangeable Counterbore Co., Detroit. Bulletin describing the Welch plug cutter or combined core drill and facer for machining shallow cored holes to insert hole plugs and also Welch plug sets for setting expansion plugs for cored holes.

Diamond Drills.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 80-B, dealing with the company's heavy duty, mounted type diamond core drill for deep structure drilling in oil field operation, and bulletin 80-C, dealing with the Sullivan Turbinair diamond drill for surface or underground prospecting.

Acetylene Generators.—Air Reduction Sales Co., New York. Catalog section 5, describing with illustrations the Airco-Davis-Bournonville acetylene generators with 50 and 100-lb. carbide capacities.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

Movie scenario writers have long looked upon the steel industry as the main breeding place of masculinity. If the hero is to be stamped as a Grade A, 14-karat he-man, set him before an open-hearth and crank away.

But Hollywood has not stopped there. It has borrowed another property used chiefly in the metal trades; the overhead conveyor. Listen:

The script of a historical movie requires the panic-stricken villain to be photographed while running through a thick wood. "I don't see how it can be done," says the director. "Me, too," says his assistant. "I know," chimes in Al, the mechanical genius.

An overhead track is run through the forest. The camera is mounted in a specially constructed conveyor, and despite the devious path made by the villain in his headlong flight, the camera is never more than six feet away.

Thus the huge American movie public is indebted to an IRON AGE advertiser for making possible a striking scene.

"Treat every man decently," said a recent speaker on industrial relations, "and fire anyone who can't stand it."

Firing is too good for him. Put him in a cage and sell him to a circus.

"See that lantern?" asked our friend, the scrap broker, pointing to a dilapidated ship lantern hanging in his office. "It cost us $7,002.46."

"Is it stuffed with seven one-thousand dollar bills and one two-dollar bill?" we inquired in our usual jocose manner.

Ignoring our facetiousness, he proceeded:

"Some months ago a shipbroker told us of a bargain in ships. We made a dicker with him. In our mind we already had spent the profits—a nice, new, shiny Chevrolet for ourselves, a new washboard for the wife, and a pair of roller skates for Junior.

"But meanwhile the scrap market broke, and we almost did, too. We lost money on every ton we sold, and all we have to show for it is the lantern. Every time I look at it I lose my appetite."

Chief decrier of the steadily aging "younger generation" and inconsolable bemoaner of the passing of "the good old days," who is none other than our old friend, the Texas foundry philosopher, writes us:

> Everyone should have a copy of Elbert Hubbard's "Message to Garcia" and should read it every morning on rising *instead of the alleged funny section* of the daily paper; and at the evening meal, *before starting out to return at midnight or later*, he or she should read Abraham Lincoln's "Reverence for Law."

Nothing short of suppression of these two books by the Government could get them among the six best sellers.

A. H. D.